THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

VOLUME XC., No. 18. Whole No. 1,769. | NEW YORK, MONDAY, MAY 3, 1909. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. H. WADELTON, Manager. THOMAS J. CUNNINGHAM and ELBERT P. CALLENDER, Editors.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

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[OFFICIAL NOTICE.]

Eighth Annual Convention, Wisconsin Gas Association.

WISCONSIN GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
RACINE, WIS., April 27, 1909.

To the Members, Wisconsin Gas Association: The eighth annual convention of the Wisconsin Gas Association will be held in Milwaukee, May 12th and 13th. The convention will be called to order by the President, Mr. David Douglas, of Eau Claire, at 10 A.M. of Wednesday, the 12th inst.

Respectfully yours,
HENRY H. HYDE, Secretary.

[NOTICE.]

Wrinkle Department, American Gas Institute.

WRINKLE DEPARTMENT, AMERICAN GAS INSTITUTE,
OFFICE OF EDITOR, GAS OFFICE BUILDING,
DETROIT MICH, March 12th, 1909.

To the Members, American Gas Institute: All members of the American Gas Institute are earnestly requested to forward contributions for the Wrinkle Department as soon as possible.

Your co-operation determines the success of the Department.

F. L. CROSS, Editor.

BRIEFLY TOLD.

THE MAN IN EMERGENCY.—We regret to have to report the serious illness of Mr. J. F. Owens, Secretary of the Natural Gas Association of America. In fact, so serious a phase of his sickness was developed in short time that he was obliged to relinquish all active work and journey immediately to Arizona in the hope that the rarefied atmosphere there would arrest the progress of the disease from which he suffers. This left President J. C. McDowell, of the Association, in somewhat of a quandary as to the details of the convention, which is to be held in Columbus, O., the 18th, 19th and 20th insts. However, in advising with his associates as to selecting a successor *pro tem.* to Mr. Owens, they agreed on Mr. T. C. Jones, of Delaware, O., to fill the gap. Like the obliging gentleman that he is, to use President McDowell's words in a circular respecting the conditions as to the Secretarial office, * * * "And I am pleased to announce that Mr. Jones has generously consented to serve the Association as Acting Secretary and Treasurer," concluding this intimation in the sentence, "I shall greatly appreciate any courtesy the members may show to Mr. Jones." In addition thereto, we all acclaim the fraternal spirit so well shown in his ready response to the call of duty.

THE FIRST ANNUAL MEETING OF THE PENNSYLVANIA GAS ASSOCIATION.—Following the organization meeting of the Pennsylvania State Gas Association, which was held in Harrisburg last November, the members are to be congratulated on the excellence and value of its first annual meeting, which was held in the Board of Trade Rooms, Harrisburg, Pa., April 14th and 15th, under the direction of Mr. L. H. Williams, of Harrisburg. Several papers were read and discussed, perhaps the ones that brought out the best debate being those respectively by Messrs. James G. Diffenderfer, of Steelton, Pa., and W. O. Lamson, Jr., of West Chester, Pa. Both papers dealt with the commercial side of the business. The attendance was excellent and the interest was sustained. A goodly addition was made to the membership. The officers elected were:

President—E. G. Holzer, Easton.
First Vice-President—John Keppelman, Reading.
Second Vice-President—E. J. Butterworth, Milton.
Secretary and Treasurer—W. H. Merritt, Lebanon.

The evening of the first day an excellent dinner was served in the Metropolitan, and later on a box party at the Majestic Theater was enjoyed, the night's entertainment being closed out in a well arranged supper—the Association on more than one occasion were virtually the guests of a certain well-known Harrisburg Public Service Corporation. That Brother Williams and his services were appreciated was plainly shown in the presentation to him, on behalf of the Association, by Mr. Keppelman, of a magnificent bunch of American beauties. The next meeting will be held in Easton, the second Wednesday of May, 1910. It was said by some that the Secretary was entitled to a string of pearls, and there was merit in the suggestion; for he certainly is a wise man. Surely, the Pennsylvania State Gas Association is here to stay and grow.

LIBRARY OF CONGRESS MAY 3 1909 SMITHSONIAN DEPOSIT.

ANNUAL MEETING, MISSOURI ELECTRIC LIGHT, GAS AND STREET RAILWAY ASSOCIATION.—The veriest condensed telegraphic message informs us that the third annual session of the body named in the title, was held in Springfield, Mo., at the appointed time last month. A good session was put on the board, although quite a little cutting of the programme, from the technical point of the work, had to be done, owing to its inordinate length. The officers elected were: President, W. A. Bixby; First Vice-President, H. J. Irwin; Second Vice-President, F. E. Murphy; Third Vice-President, P. A. Bertrand; Secretary and Treasurer, C. L. Clary. The next meeting will be held in Jefferson City. It was also determined to amend the title of the Association, so that it shall hereafter read, "Missouri Electric Light, Gas, Waterworks and Street Railway Association." This certainly seems lengthy enough, and the titling further shows that it should be able to get a pretty fair list of members, in time.

BOOSTING THE TUNGSTEN VARIETY OF ELECTRIC LAMPS FOR STREET LIGHTING.—Now that the electric interests have assured themselves of the possession of a small unit which can be operated with a "comparatively small amount of energy," they are claiming that mantle gas lighting will soon be relegated to the rear. Possibly, yes; but as it is not unusual for the electrolytes to claim that the 40-candle power tungsten lamp is the equal of the 60-candle power mantle gas lamp, it does look queer to read this in a comparative late number of *The Electrical Review and Western Electrician*, which editorially sets forth certain conditions as follows, under the caption, "A Field for Electric Street Lighting:" "Mantle gas burners now do much street lighting that would make paying loads of tungsten lamps for electric stations. As the gas mantles, when new and supplied with good gas at the rate above named, give about 50 horizontal candle power, it has been hard to compete with them with carbon incandescent lamps in street lighting. For a 50-candle series carbon lamp the power would be at best 150 watts, and if the charge of operating and renewing this lamp were 10 cents per kilowatt-hour, the cost to the city served would be 1.5 cents per lamp-hour. This figure shows why it has been hard to compete with the gas mantle lamp at 0.6 to 0.8 cent per hour. With tungsten lamps the situation is quite different, for the 60-candle size requires only 75 watts, costing a municipality 0.75 cent per lamp-hour, on the basis of 10 cents per kilowatt-hour for the service. Lamps at the list price of $1.50 each, with an average life of 1,000 hours, make the cost 0.15-cent per hour for the lamp alone; that is, for lamp renewals, and their remains 0.6-cent per hour or 8 cents per kilowatt-hour for the energy on the 10-cent basis." Should the 60-candle tungsten lamps be equal to the upright mantle gas lamp in candle power, how do they compare when the sources are installed on the street? When a city decides to use tungsten lamps it means a large increase in the number of poles, with dangerous as well as unsightly overhead wires; and, even with these accessories, they can only be installed upon one side of the street. Although the sums spent upon street lighting have been ridiculously small in the past, there is every indication that this condition will be considerably improved in the near future, judging solely by the increases made on such account within the last 5 years. When this additional money required for additions is available it is important that gas be not overlooked, as it possibly will be, at least, unless more strenuous efforts are put forth in its behalf. If the 60-candle power tungsten can compete with upright mantle burners, what will happen when the inverted type is brought out? Will it be all over but the shouting when it arrives?—"O."

MR. C. D. LAMSON has resigned the position of Manager of the Boise (Idaho) Gas Light Company. His successor is Mr. C. M. Eyman.

[Continued from Page 774.]

Review of the Twenty-Fourth Annual Report, Massachusetts Board of Gas and Electric Light Commissioners.—No. III.

[Prepared for the JOURNAL, by MR. H. THURSTON OWENS.]

Profits.—The apparent profit of the companies from their gas business was not quite as large as in 1907, but the amount received from rents increased from $117,209.63 to $846,970.92, or $729,761.29, so that the total profits were greater by $619,745.99, as against $227,391.98 for electric companies.

Dividends.—There was an increase in dividends of over half a million dollars, the total representing 9.1 per cent. on capital stock and 26.37 per cent. per 1,000 sold. The total amounts of dividends paid out by 53 gas companies amounted to $2,761,039.24, as against $2,019,933.50 for 32 electric companies.

Companies which appear not to have earned expenses numbered as follows:

	1906.	1907.	1908.
Gas	5	4	6
Electric	4	1	5

Companies which have not earned enough to declare dividends:

	1906.	1907.	1908.
Gas	25	21	23
Electric	26	27	26

Yearly Surplus.—The total surplus for the year of gas companies increased from $533,676.97 to $873,479.93.

Assets.—All assets show an increase, with the exception of investments, the total assets being $60,028,172.29, showing an increase of $4,757,275.55; over $3,400,000 of this amount being included in real estate, machinery, street mains and meters.

Liabilities.—The total liabilities are $52,538,675.77, the increase being smaller than the increase in assets.

Reserve and Depreciation Funds.—The money set aside for this purpose again shows a decrease in the case of gas companies, while the reverse is true of electric companies; the figures for the past 3 years are as follows:

	1906.	1907.	1908.
Gas	$749,534.31	$736,767.55	$676,389.88
Electric	542,152.75	729,926.57	912,616.40

Surplus.—The actual surplus is equal to 24 per cent. on capital as against 22 per cent. in 1907, the total amount being $7,489,496.52 whereas the surplus of electric companies amounts to $2,828,516.80, being equivalent to 13.78 per cent. on capital.

Reduction in Price.—In 12 cities there was a reduction in the price charged, and in 20 more the average price was lower than in 1907.

Average Price.—As usual the average price of coal gas since 1886 is presented and as usual it has been again decreased, amounting to $0.921 per 1,000 sold.

The average price in Holyoke, the largest of the four municipal gas plants, was $1.01.

INSPECTIONS.

Gas Inspection.—The number of inspections, as regards quality and purity, were much greater in number than in the Second District of New York State, the total numbering 1,018, as against 977 for 1907. In all cases the average candle power was above the legal standard of 16, and in only 21 cases (16 companies) were readings taken below this figure, as against 31 cases (18 companies) for the previous year.

Eight plants show an average of over 20-candle power. The highest reading was taken at Webster, 24.7, where the average price of gas was $1.47, and the lowest reading (12.3) at New Bedford, where gas costs $0.89.

Oil gas showed about the same results as those reported last year, in the four companies 22 to 48. Acetylene was 184 and 181-candle power. The average candle power for coal gas, water gas and mixed gas, is in each case below that of 1907. A comparison with the figures from the 1907 Report of the Public Service Commission, Second District, State of New York, is given:

TABLE I.—*Showing Average Candle Power in the Eight Largest Companies in Massachusetts and New York (New York City excepted):*

City.	Number of Inspections.	Average Candle Power.	City.	Number of Inspections.	Average Candle Power.
Boston	72	18.75	Albany	25	20.3
Cambridge	53	18.58	Buffalo	26	17.6
Fall River	53	20.40	Mt. Vernon	27	21.4
Lawrence	53	18.50	Rochester	26	20.8
Lowell	53	18.42	Syracuse	26	21.5
Lynn	53	18.38	Troy	26	21.5
Springfield	53	17.81	Utica	16	20.3
Worcester	53	18.55	Yonkers	26	21.7
*Holyoke	27	17.74			

*Municipal plant.

The candle power was found not to be up to the standard once each at Lowell and Holyoke, but among the 8 New York companies this occurred 35 times. The requirements on that account are higher in New York than in Massachusetts.

The instances where the requirements as to sulphur were not complied with continue to increase, the most persistent delinquent being Holyoke, with 16 out of 27 tests. Perhaps Mr. Snow's endeavors to have the plant put in suitable shape will speedily change all this. The troubles from both ammonia and sulphuretted hydrogen show much less prominently than in 1907.

(To be Continued.)

The Reinforced Concrete Foundation of the New York and Richmond Gas Company's New Gasholder at Clifton, Staten Island.

[Prepared for the JOURNAL by MR. R. P. RAYNSFORD, M.E.][1]

The practice of erecting a gas works in the lowest available point of the section which it is proposed to supply with gas often leads to difficulties in the construction of foundations for the more or less substantial structures necessary for the working of a modern gas plant. This is particularly true of those gas companies that have been organized for half a century or more, the growth of which necessitates additional storage capacity and the erection of larger holders. From time to time these companies have added to their equipment, reserving for coal storage those sections of their property that are low and boggy, or otherwise unsuitable for building operations. It is then that difficulties arise, and it frequently becomes necessary to resort to somewhat novel methods to secure a foundation sufficient for the load.

Such a condition existed at the site of the New York and Richmond Gas Company's works, at Clifton, Staten Island, N. Y., where the Messrs. R. D. Wood & Co., of Camden, are erecting a million foot, quadruple-lift holder on a reinforced concrete foundation placed by the Raymond Concrete Pile Company, of New York and Chicago. The wash-borings that were made showed a soft top-fill, about 4 feet deep, underlaid by a 10-foot layer of coarse sand and gravel, on a harder layer of clay about 3 feet thick. Below this so-called hardpan a stratum of fine, wet sand extended to an average depth of 35 feet. This condition of the soil showed the desirability of driving piles, whereupon the question of the relative merits of wood and concrete piles arose.

The site of the holder is about 200 feet back from the shore of New York Bay, and the mean water level is about 6 feet below the proposed level of the foundation. Wood piles would have necessitated excavating to an average depth of 7 feet, the cutting of the wood piles at that grade, and the filling of the excavation with concrete. By using Raymond concrete piles, however, not only were fewer piles required, but the costs of the excavation and great amount of concrete in the slab that would have been necessary had wood piles been used, were saved, due to the fact that concrete piles need not be covered with water, as do wood piles, and they may, therefore, be stopped at any desired point.

Raymond concrete piles are made by driving a tapering, sheet-steel shell to refusal by means of a collapsible steel core, withdrawing the core and thereupon filling the shell with concrete.

The shell consists of a number of circular sections, that are formed by uniting the vertical edges of two pieces of 18 to 20-gauge sheet steel, bent into shape by a cornice brake. The diameters of the sections range, in a decreasing ratio, from the uppermost section to the point or boot. The latter is stamped from a single piece of 16-gauge stock.

The core is composed of three steel segments forming a tapering cylinder or cone. The segments are separated or brought together through the action of a series of wedges. A driving cap is attached to the head of the core.

The shell is assembled by slipping the various sections composing it over the core, the segments of which are expanded at this stage. Placing the boot in position over the point of the core completes the shell. The sections overlap sufficiently to exclude any soil, water, or other foreign substances that might otherwise gain admission into the shell while it is being placed.

After the core is completely incased in the shell it is driven to refusal. The core is thereupon withdrawn by bringing the segments together, or "collapsing the core," as the operation is termed. The shell, which is of sufficient strength to retain its shape after the withdrawal of the core, remains permanently in the ground and forms a mold or form for the concrete.

1. Construction Superintendent, Raymond Concrete Pile Company.

Before being filled the shell is subjected to careful inspection. After inspection, thoroughly mixed concrete, composed of one part good Portland cement, three parts sharp sand, and five parts crushed stone or gravel of suitable size, is poured in, being carefully tamped, as shown in Fig. 1, until the shell is filled.

It was expected that the piles would bring up in the hardpan mentioned, but when work was started it was found necessary to drive about 5 feet further where a good resistance was obtained.

Two hundred and ninety-three concrete piles were driven to an average depth of 25 feet until a penetration of $\frac{1}{10}$ of an inch per blow with a 3,000 pound steam hammer was obtained. The piles were laid out 6 feet 6 inches on centers on the circumference, and in rows 6 feet on centers inside. Reinforced concrete beams connected the piles, and over these was laid a reinforced concrete slab, 6½ inches thick, com-

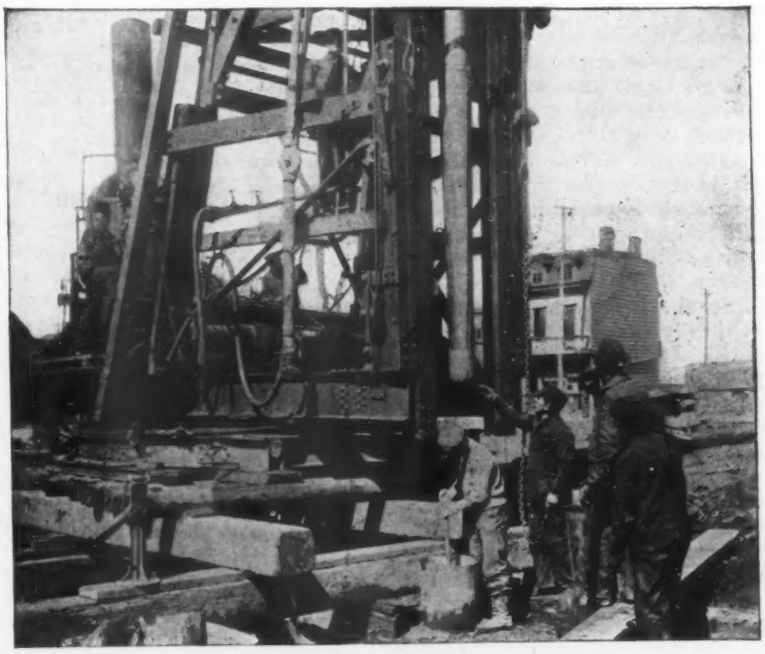

Fig. 1.—Tamping the Concrete in the Shell. Above the Tamper is shown a part of the Driving Core incased in the Shell.

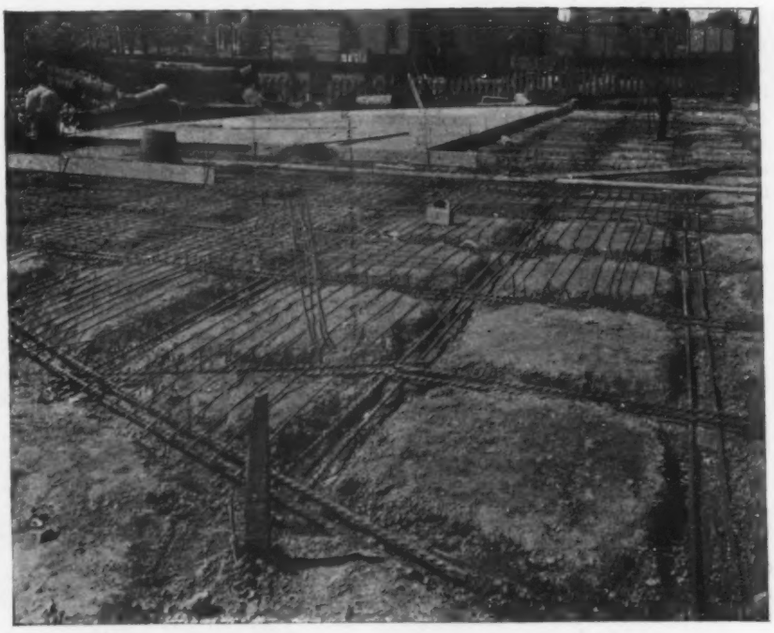

Fig. 2.—Incompleted and Completed Sections of the Concrete Slab.

pleted and incompleted sections of which are shown in Fig. 2. The saving effected by this construction over that which wood piles would have made necessary is self-evident. It is also probable that the deeper excavation that wood piles would have necessitated, would have had to be shored and pumped, and consequently materially in-

creased the cost of the foundation. In addition to the piles driven to support the tank proper, extra piles were placed for the support of the footbends under the inlet and outlet risers, as the ground itself was considered too soft to support these properly.

[Communicated by Mr. M. H. Spear.]

The Lighting of One Suburban Theater.

I feel it is of interest to gas men to discover new ways of extending their business, which naturally includes the seeking of new ways for the use of gas, and in such belief I venture the assertion that we have hit upon a scheme that will increase our revenue at a very small additional cost to our Company.[1] Theaters, of the sometimes closed class, and moving picture shows of modern type, have always been hard to reach on account of demanding some means of quickly turning on and off the lights. When we learned that a theater, which bids fair to be of some permanence, was to be located in Flushing, we, of course, started right in to secure the proprietors' contract to use gas for its illuminating, and the first objection they made was this one regarding ease and certainty of turning on and off the lights. Prior to this we had been experimenting with self-lighting mantles, and, with the theatrical man's stipulation in view, we took up the question with W.W. Barnes, of the Auto-Igniter Company, and commenced experimenting on the Humphry gas arc equipped with self-lighting mantles. After a few days of this sort of experimenting we felt sure that we could meet the stipulation, and renewed our attempts to secure the customer. We showed him how much money could be saved by using gas in place of the electric current, and eventually succeeded in taking his order on a guarantee from us that the lights could be readily turned on and off, also guaranteeing satisfaction in respect of the illumination. Further, that we would allow a trial for 30 days, the same to be at our cost, if the result was not satisfactory to the proprietor—the building was wired for an electric supply.

Our great difficulty at the outset was that the lamp flashed back; but we finally overcame that defect by using an extra screen in the burner cap and another around the Bunsen division of the burner. This proved that we could use three maintenance mantles and one self-lighting mantle; but, as a matter of safety, we use two of them.

We installed 10 Humphry arcs and turned them on and off by means of a valve properly set on the stage. It is used between each act, and the lights are put in service and extinguished without any noise, and we have not had a complaint since the installation was put in service. We "maintain" them once a week, and find that the cost is only a trifle more than that incurred in the old or former practice. Besides getting this business in the main part of the theater we got all the rest of the lighting, except that on the stage, whereas if the electric light people had managed to get in on the main part they undoubtedly would also have gotten the balance. We are, as a result, selling about $20 worth of gas a week that would not be coming to us except through our adaptation of the described means of lighting and extinguishing the lamps.

[Continued from page 735.]

PROCEEDINGS, FIFTH ANNUAL MEETING, ILLINOIS GAS ASSOCIATION.

Held in Chicago, Ills., March 17th and 18th, 1909.

First Day—Morning Session.

Discussion on the Lea Paper.

[For the text of the paper by Mr. Lea, on a "New Method of Manufacturing Water Gas," see *ante*, page 732.]

The President—This interesting paper is before you. I will ask Mr. Battin to start the discussion.

Mr. Battin—I have not checked up Mr. Lea's figures, but the paper carries a very great amount of interesting data applicable to gas making processes of all kinds that are in use, and data moreover which has represented an enormous amount of work, no doubt, to get together, and which has a value that would make it desirable, I think, for Mr. Lea to incorporate in the "Proceedings" the notes and references as to where this data had been obtained. However, a great deal of it, I am sure, he personally obtained from actual experience, especially in the producer field. The secret of the success of the process, if it works out in practice, will be found in the fact of its continuous operation. People who sell producer processes have an old saying, "Continuous processes mean continous profits." And there is no question about it, if the temperatures can be kept, as Mr. Lea believes they can, uniform in a continuous process, the percentage of efficiency that can be obtained will be very much increased over that of our present processes. The secret of this whole paper lies in the paragraph on page 18, where he says: "Because the formation of tar may be entirely avoided by continuous operation, under correct conditions of temperature and pressure, it seems reasonable to assume that we can attain a thermal efficiency of 90 per cent. in the gasification of oil in the presence of inert gases which themselves supply the required heat and temperature." This is a rather high percentage to look for; but we can approach it, especially in the case of gas of the lower heat value. In other words, I think the gas running about 300 B.T.U.'s is the more promising field. I believe gas companies would be rather slow to take up a proposition of this kind. On the other hand there have been for years attempts made to carburate producer gas by people interested in metallurgical work and in glass furnaces, or similar operations, and I think that here is a field which is very promising. It seems that here is a chance to make a 300 B.T.U. gas that will have the advantages they have all looked for, one of which is that the flame has luminosity. Now, the amount of luminosity in any of these gases that Mr. Lea figured out, will probably not be very great, on account of the CO_2, in fact, that would work against it in the case of ordinary gas company distribution under the present system; but for the metallurgical work the gas has enough luminosity to make it of value. A point which does not seem to be explainable is that a gas of a certain heat value, giving non-luminous flame, is not anything like as effective for metallurgical work as one which has a luminous flame; so I think that here is a place where the process can be tried out. It is certainly worthy of a practical test in the case of a plant that is operating a producer for metallurgical work. [Applause.]

Mr. J. L. Unger—Gentlemen, I came here by invitation (I am not a member yet of the Association), but as I had the opportunity to read Mr. Lea's paper about a week ago and thought I found an error in it, being a friend of his, I called on him to show him that error. He did not see it in my way and I could not see it in his way, so he invited me to come before the convention, and here I am with my exceptions to some of his statements. Assuming the efficiencies of carburation and oil gasification are, as stated by Mr. Lea, which is very much doubted, and that he adds 6.7665 pounds oil = 76.65 cubic feet oil gas to 51. 1 cubic feet producer gas from 1 pound coal, and that these gases must be heated to 1,450° F. for complete carburation, the additional producer gas admitted at 882 and burned must be 75 per cent. more than he states, or about 65 cubic feet, instead of 37.134 cubic feet, because Mr. Lea omits to allow for heat to balance the heat carried out and lost by the product of combustion. Assuming that these products of combustion must be heated to 1,550°, or 100° more than the other gases, in order to allow for heat transfer between them, then the heat required will be:

20.05 cubic feet CO_2 heated 1,490°	1,062
98.00 " N_2 " 1,490°	2,810
14.28 " H_2 " "	505
Total heat in product of combustion	4,377
Heat required, according to Mr. Lea, to heat the other producer gas, the oil gas and the tar	5,717
Total	10,094
Add 9 per cent. for losses	908
Total heat required	11,002

$$\frac{11,002}{167.8} = 65.4 \text{ cubic feet.}$$

Gas will Contain:	Cubic Feet.		B.T.U.
Original producer gas	51.04 by	151.5	7,742
Products of combustion	118.05	....	0
Oil gas	76.65 "	1,617.2	123,575
Tar gas	1.00	....	667
	246.74		131,984

$$\frac{131,984}{246.74} = 535 \text{ B.T.U. per cubic foot, instead of } 672.75$$

To obtain this thermal value there are used:

	B.T.U.
51.1 cubic feet producer gas = 1 pound coal	11,237
65.0 " " " " = 1.274	14,316
76.65 oil gas from 6.7665 pounds oil	130,079
	155,632

1. New York and Queens Gas Co., Flushing, N. Y.

$$\frac{131{,}984 \times 100}{155{,}632} = 84.16 \text{ per cent. efficiency, instead of } 88.28$$

This efficiency is still too high, owing to Mr. Lea's assumption of 95 per cent. efficiency of the oil conversion. Mr. Lea assumes that there will be no tar formed from the oil, and that the condition of gas carburation will be more favorable than is the case in ordinary water gas practice. The process proposed differs from water gas practice in being continuous instead of intermittent, which, in some respects, is an advantage; but since he is obliged to admit the oil after the combustion of the producer gas has taken place, he loses the benefit of heat transfer between the gas and the brickwork that has been heated by the producer gas flame, and must depend upon his heat transfer solely from the hot gases of combustion. His carburetting apparatus may be compared with a Lowe water gas set, in which the carburettor is used solely as a combustion chamber burning the necessary producer gas, and the superheater used as a carburettor for the heating of the oil gases without any admixture of air. It would, therefore, seem that his conclusion, based on water gas practice, that only 9 per cent. will be lost in radiation and convection during the curburetting, may not be warranted, as the process is different. Mr. Lea evidently obtains his data about temperatures and heat losses from Mr. A. G. Glasgow's paper on "The Practical Efficiency of an Illuminating Water Gas Setting," and it may be of interest to point out the efficiency of the oil gasification from Mr. Glasgow's experiments. Mr. Glasgow used a lighter oil than Mr. Lea, consequently an oil that makes more gas per pound, but Mr. Glasgow gets only 355 cubic feet oil gas from 5 gallons of oil, or 10 cubic feet from 1 pound of oil, whereas Mr. Lea assumes 11.3278 cubic feet. Mr. Glasgow gets 1,555 B.T.U. per cubic foot of oil gas, whereas Mr. Lea assumes 1,612.2 B.T.U. Mr. Glasgow gets 15,550 B.T.U. per pound of oil in his gas, whereas Mr. Lea assumes 18,263 B.T.U., or a result 15 per cent. higher from an oil inferior to Mr. Glasgow. The latter estimates the ultimate heat effect of a pound of oil at 20,000 B.T.U., and gets back in his gas 15,550 B T.U. or an efficiency in oil gasification of 77.75 per cent. Mr. Lea assumes an efficiency of 95 per cent. Mr. Glasgow gets 5 pounds of tar from 5 gallons of oil, and besides confesses to a loss in a machine of 8 per cent. Mr. Lea gets no tar and estimates his loss at only 5 per cent. Mr. Glasgow uses 33.4 pounds hard coal per 1,000 cubic feet carburetted water gas, which, at 13,500 B.T.U., is equal to 450,000 B.T.U.; 35 pounds oil per 1,000 cubic feet, less 5 pounds tar, at 20,000, or 600,000 B.T.U.; total B.T.U. required per 1,000 cubic feet gas 1,050,000 B.T.U. The carburetted water gas of 30 candles from calculation contained 764 B.T.U. per cubic feet, or per 1,000 cubic feet, 764,000 B.T.U.; loss during process, 286,000 B.T.U. or 72 per cent. efficiency, not figuring on coal used for steam making. Mr. Lea's figure of 88.28 per cent. for producing 672.75 B.T.U. gas would seem too high for anybody to believe without demonstration from practice. According to my criticism above, these figures should be 84.16 and 535 respectively, still based on Mr. Lea's assumption of heat efficiencies of conversion.

Mr. Hartman—I have not verified Mr. Lea's figures. I have taken the results as given for granted, and, therefore, I am prepared to discuss the paper only in a general way. It shows a thorough grasp of the subject of producer gas and its applications; and, while from its very nature it is exceedingly theoretical, yet it is interesting as opening up a new line of thought in the gas industry. But I wish to say that I have read the paper carefully several times, and must admit that I fail to see the reason for this new method. To be sure, it is nice to have something run continuously, but is it going to save any money? I notice that the author favorably compares the cost of raw materials at 16 cents with the corresponding cost of 22 cents in water gas manufacture. Are we to understand, from the fact that he does not mention the cost of coal gas or coke oven gas, that he wishes to supplant merely water gas with this proposed gas. If it is meant to compete with all existing methods of gas manufacture, cost comparisons should be carried further. This gas is almost as heavy as air. The author says that the additional cost of distribution on that account will be extremely difficult to discover in actual operation. I would dispute that statement. The quantity of gas flow in a given sized pipe varies inversely as the square root of the specific gravity of the gas. In other words, a pipe that will pass 1,000 cubic feet of coal gas of gravity .4/10, would pass only 550 cubic feet of the proposed gas of gravity .950. This difference is so great that I would say that we could not fail to notice it in actual operation. Studying the analysis of this gas, we see that the amount of unsaturated hydrocarbons is nearly 17 per cent. The unsaturated hydrocarbons are constituents of comparatively low vapor tensions, and consequently are more easily driven out of the gas by compression or a lowering of the temperature. Therefore, it is to be expected that a gas depending for its heating value on so large a percentage of unsaturated hydrocarbons would not hold its heat units under compression in high pressure distribution, or under exposure to cold in high or low pressure distribution, nearly as well as our coal gas or water gas of present practice. I agree with Mr. Battin that this method might find a very profitable field in metallurgical work, but I do not believe it is practicable in competition with the present coal gas or water gas manufacture.

Mr. Lea—In giving the cost of 22 cents per 1,000 feet for raw material, I certainly do not mean to say that 22 cents is the lowest cost reached in practice. These figures are given only to show relative costs under specified conditions. Not long ago a certain company in Texas, which could buy Texas oil for 3 cents a gallon, found, after considerable investigation, that the best process they could install was the crude oil water gas, in which case it took 11 gallons of oil per 1,000 feet of gas made. That is 33 cents per 1,000 for raw material. That particular plant has, immediately available, enormous deposits of lignite, which can be very successfully used in the producer. This lignite has a value of about 7,300 B.T.U.'s, and can be delivered at the gas company's plant for $1.25 a ton. That lignite used in the producer, with that same oil used for the enriching of that producer gas, apparently would make it possible to bring the cost of the raw material per 1,000 feet down to less than 16 cents, as against 33. I understand, of course, Mr. Hartman, that there are better costs being made than 16 cents per 1,000. All I am trying to do is to give relative figures. If I wanted to show the cheapest I would not take oil costing 3½ cents, for instance. I have not seen any of the figures that Mr. Unger presented here, although he did point out what he considers my error in my calculation. I say that a producer gas has a certain value, say 135 B.T.U.'s per cubic foot. Mr. Unger says if I am going to burn that gas I have to allow for the amount of heat required in raising the temperature of that gas, together with the air consuming it, and I maintain that is incorrect, because we do not find any gas has any given value until we have already made allowance for the raising of the gas and air required in combustion to the temperature of combustion. Consequently, that value of 135 B.T.U.'s, or whatever other figure I used in that case, will cover the loss that Mr. Unger pointed out. He says, too, that before you can transfer heat from producer gas to the oil gas the producer gas must be 100° higher in temperature. The difference in temperature between the heating and the heated gases will, of course, be determined by relative volume, other things being equal; but I do not know what this difference would be. On the other hand, 1,450° will be found higher than required in many cases. Mr. Unger objects to my assumption of 95 per cent. efficiency in the transformation of oil into gas. The statement in which I refer to the 95 per cent. is based upon the condition that the heat required and the temperature required be obtained from the accompanying producer gas and produce the combustion, and the difference between 95 per cent. and the total of 100 per cent. is only the amount of the oil that remains unaccounted-for. Mr. Unger compares the figures I have given with the figures from Mr. Glasgow's paper. I have studied Mr. Glasgow's paper, but I have not used Mr. Glasgow's oil figures, since I am not using Mr. Glasgow's oil. I simply specify the oil I am using in this calculation. It is not to be expected that the various steps may be fairly compared in detail with those of water gas practice, since one process is intermittent and the other is continuous. Mr. Unger said that the oil I was considering was inferior to the oil that Mr. Glasgow had used, but this point I don't remember. The figures that I used as to specific heat are not the figures used by Mr. Glasgow. Mr. Glasgow's figures have since been revised; that is to say, the figures Mr. Glasgow used in writing his paper in 1890 have since been shown wrong in some particulars, and I have used the corrected figures in each of my calculations, drawing mostly from the work of Thompson and Le Chatelier. That is all I have to say.

The President—I am sure I voice the sentiments of all the members in offering Mr. Lea the thanks of the Association for his paper. We will now have a paper that is especially interesting to a large number of men in this Association, because a very large number of the companies in this State are small ones. We will hear from Mr. E. H. Negley, of Canton, Ills., on

THE MANAGEMENT OF A SMALL GAS COMPANY.

The management of a small gas company is particularly interesting from the fact that the manager must be very closely associated

with every phase of the work. This makes his responsibility even greater than that of the heads of some of our larger companies, who are relieved by superintendents, assistants, foremen, etc., while the small company's manager must necessarily be all of those.

He should also be a structural engineer, a distribution man, a street foreman and civil engineer. Then to take care of the commercial side, he should understand advertising, be a competent bookkeeper and accountant, and also have a fair knowledge of stocks, bonds and legal business. He must be popular with the business men, be a good judge of human nature, and have plenty of patience in handling customers.

The paramount aim of every gas manager is to furnish to his customers a product of the very best quality, at the least cost of production, and, at the same time, to operate his plant in such a manner that best results as to efficiency and capacity are obtained.

This is not always the easiest part of his duties in a small works, and by "small works" I shall include only plants sending out less than 100,000 per 24 hours. For, in the first place, to make 75,000 cubic feet of gas on 2 benches of sixes, you will require nearly as much bench fuel as though using the full capacity of your retorts. Ammonia is made in such small quantities that a still would be expensive. Carbon cannot be sold in less than car load lots to any advantage, and it would require nearly 10 years to accumulate a car load of carbon. Tar may be shipped to nearby manufacturers or may be sold locally. In our locality the Illinois river fishermen furnish a very good market for small lots. Our coke may possibly command as high prices as the larger works, but the small city does not furnish the local demand our large cities do, especially when soft coal retails at $2 per ton in the bin. I shall not attempt to draw too many comparisons between large and small companies, but will attempt to outline as nearly as possible the duties of managing a small gas company.

Manufacture.—The works is in charge of a foreman or head stoker, who keeps surveillance over all things, but at the same time assists in drawing, charging, firing, and, in fact performs an equal share of the work. He makes a report each morning of all existing conditions. This report includes the number of charges, weight of each charge, bench and boiler fuel used, temperature of gas at all points, and statements of station meter and holder at 6 A.M. and 6 P.M., with a list of coke, tar, or nything else delivered from the works each day. The manager should collect these reports upon his visit each day to the works. On the days he is unable to reach works, the report is sent in by telephone. A book is kept in the office showing these reports by months and years. The net amount of gas accounted for is also shown here, and the percentage of loss is figured.

Comparisons with former months, years, etc., may easily be made in this manner, and are very valuable in showing increases and decreases. No one can so intelligently figure profits, or losses, as by comparisons with like periods. A very good way of showing increases or decreases is by drawing curve charts, marked into months and years, or even days, if necessary.

Orders are issued at the office for all material purchased locally for the works. All tar and coke must be paid for at the office and orders given on the foreman to deliver same. The works should be provided with a photometer and with pressure gauges, that stokers and foremen may see at all times the quality of gas being made. Frequent estimates of gas coal, coke, tar, etc., on hand should be made, and any irregularities, broken parts, leaks, etc., in any of the apparatus, should be noted and remedied at once.

Most small works do not have duplicate machinery of all kinds, and usually only a small holder, so that any small break may cause a shutdown of the entire plant. The writer experienced this difficulty a short time ago, when the key holding the exhauster shaft to the engine came loose about 2 o'clock A.M. Having only the one exhauster, we were compelled to shut down, and before we could start again, at 10 o'clock, our holder had touched bottom; so it behooves us to be continually on the watch for any sign of defect or break. The holder should be painted each year and the rollers oiled frequently. Buildings should be painted often and repairs in general be well kept up. A very good holder and iron paint can be made by mixing 5 parts tar, 3 parts dry Portland cement and 1 of coal oil. This is inexpensive and can also be used on boiler, stacks and roofs. Trash, old iron, brick, etc., should be cleaned from the yards, weeds should be mowed, and ashes and cinders hauled away. A little care along these lines will improve the general appearance a great deal and add materially to the life of a gas works.

Distribution.—After the gas is properly purified and put into the holder, sufficient pressure should be carried to insure 3 to 4 inches of water pressure in all parts of the city. Where the holder pressure is deficient it is sometimes necessary to weight the holder, in order to secure the required amount, but this may be easily done by placing barrels of sand or bricks over the crown. This weight should be evenly distributed, and if the holder should ever touch bottom, all weights must be removed to prevent collapse.

The main drips at the holder should be pumped every day, and all drips throughout the city should be pumped at regular intervals. The amount of water and tar received from each drip should be noted, and this will serve to gauge the length of periods for pumping. Drip water should be caught in cans or buckets and not pumped out on terrace or pavement. Drips should be carefully located in the mains and the pump connection should be measured from nearest street intersection. Also, the number of house it is in front of should be recorded.

Care must be taken in selecting the size of mains to be laid, being sure to get them large enough, for the cost of ditching and laying is practically the same for large sizes as for small. Those who are fortunate enough to have large size mains placed on all principal streets are to be congratulated, for in a number of our small cities streets have been started with perhaps a 3-inch or, in some instances, only 2-inch, later, perhaps, dropped to 1¼-inch. Of course, as extensions are wanted on these lines it is necessary to begin at the starting point and lay entirely new pipe, using only 3-inch or 4-inch, which was originally the main supply, to finish the extreme end. It then appears to the president and directors that too much money is being expanded for mains without sufficient revenue. The depreciation charge is also increased in the year these replacements are made, so I sympathize with the manager who takes hold of a property with small mains.

Where wrought iron pipe is laid it should be well coated with tar similar to the above recipe given for holder paint. If conditions permit, this pipe can be painted during stormy and winter days, allowing plenty of time for it to dry before handling is necessary. Service pipes in most cases are installed free of charge, for the first 50 feet at least, and in all cases should be well coated. Pipe and fittings must be painted either before using or in some instances paint can be put on after they are placed in the ditch. No service smaller than 1¼-inch should be used, unless it is tapped to a large main where high pressure is carried; then 1-inch may be used. Where taps are made in cast iron, a street tee should first be placed in tap, with top opening plugged and street elbow placed in side. From this elbow the service can be continued. This form of joint allows flexibility and lessens breaks and splits from sagged services. Services must never be laid on loose or filled earth. Frequently we are asked to lay pipes in water and sewer ditches, but this is bad practice, for trouble is sure to come from it. In some instances, however, a water ditch is the only medium, and in this case a shelf may be dug on one side and pipe pinned on this. Accurate measurement of all pipe and fittings used, together with labor required, should be turned into the office, also the distance from the street intersection or alley, with a diagram showing how service enters house.

In the office the exact cost of installing each service, and a plat of the service, is filed either by streets or by a number given each service. A large map, showing size and location of mains, must be kept up-to-date, and a blue print placed in the hands of the city engineer. A detail map, showing location and size of all tees, valves, etc., serves to make a more complete record of our underground pipe system. That the best service may be given all customers, an experienced appliance man should visit everyone at regular intervals of perhaps once each spring or summer. He should be instructed to thoroughly clean, regulate and demonstrate the use of every gas consuming device on the premises, making a note of any trouble he is unable to remedy at the time, and either return later or report to office, that proper attention may be given. He should also report any stove beyond repair, so that the customer may be solicited for a new one.

All old burner tips should be replaced with new ones, and the use of mantle lights urged. A sample of two or three good burners and some mantles may be carried and orders taken for them. The man doing this kind of work should be polite and clever, using some diplomacy in his talk, and should be paid by salary only, as a commission on sales would cause the employee to slight repairs and adjustments.

A great many times stoves and appliances are not used because the housewife is afraid to use them or does not understand their use, and by continually educating the people to "cook with gas," we will be

able to increase its use on services already installed, which is the most profitable kind of business obtainable. Merchants may obtain new customers without any noticeable expense, but even when a new gas consumer is added it requires an additional investment of $10, $15 or maybe $25; so, as above stated, the only new business the gas company can get, without investing any money, is to educate those already connected to use more.

It is very often a question as to the best method of inspecting and repairing consumers' meters, as most small companies do not maintain a repair shop. Meters must be inspected at regular intervals, and, in order to cover the situation to the best advantage, the first article necessary is an accurate prover, and no company is too small to have one. A quantity of extra meters should be on hand before starting, and a regular route must be laid out covering the entire city, and may be routed as the meter readers tickets are. Meters are then brought to the shop and carefully proved and tagged; if found correct the same one is returned; if incorrect a new one is set. The record of meters removed, and also of those reset, is placed on route sheet and turned into office.

By removing the top of meters found incorrect a careful test is then made, and all those showing leaky diaphragms or other serious troubles should be sent to a regular shop; but if the interior seems in a fair condition, it should again be connected to prover, and by moving the tangent connection in or out the meter may be adjusted to accuracy.

In case the valves are dirty, a drag may be felt by revolving the post connected to them. The back plate should then be removed and valves cleaned with soft cloth or some benzine. Any practical man can soon learn to use a soldering iron so the top may then be replaced, and thus will many meters be satisfactorily repaired in our own shop with little expense and with only a few inexpensive tools. A complete test of all meters connected is soon covered in this way and, if the work can be done during the winter months, and at odd times, it will prove to be one of the most profitable investments made.

Commercial.—The commercial side of a small gas company is perhaps more closely under the control of the manager than any other department, for he must do something else than manage. He is compelled to be in the office at least half of his time, and almost every night after supper. His hours of work begin at 7 o'clock A.M. and end from 6:30 'til 10 o'clock P.M. He must be ready at all times to satisfy complaints of whatever nature, and this is not always an easy task, for in the smaller cities we are personally acquainted with nearly all our customers and are meeting them each day, so that we cannot be quite as independent as in larger places. Nevertheless, we have our rules firmly established and work to them as nearly as possible, but endeavor to give everyone a square deal. If anyone has a real complaint to make we treat it with all consideration, and give all that is due, but no more. In this way we may in some cases lose a customer, but it is far better than paying two prices for his business, for the old saying, that "a satisfied customer is a company's best asset," is always true; but on the other hand a "knocker" is a serious liability.

All material purchased, locally or outside the city, must be O. K.'d by the manager or an authorized clerk. All orders for work are placed in a book for that purpose, and a written order given the proper workmen. When work is completed the order is returned and the material used is noted thereon. All meters set or removed are reported on printed tickets during the day. Tickets containing a record of meters set are numbered consecutively, and are copied in a book in regular order, and should one be lost, it is immediately noticed, and can be traced at once. In this book may also be copied the cost of pipe, fittings, etc., used on each job; also the number and make of each stove set. This serves to keep an up-to date record of the number of stoves sold each month, and can be easily referred to if stoves need repairs.

A large assortment of stoves should be kept on the display floor, and they should be clean and new at all times. We cannot expect to sell elevated oven and cabinet styles unless they are shown, as people depend on the gas companies to handle the latest models. Prices should not be too low to allow a reasonable profit on everything that is sold. Small companies must push the sale of stoves and appliances, also mantle lights of all kinds, keeping a good window display, and a well lighted office and showroom are absolutely essential. Too much cannot be said as to window displays. Other merchants value their windows as much for advertising as any other medium they have. We have, in our city, merchants whose window lights cost them $25 per month, and if our windows are changed regularly, showing good, clean, well arranged articles with prices attached, and uses explained, they are sure to sell goods.

Gas arcs and incandescent burners should be installed in all parts of the office and burned liberally. We have light to sell, and if it is not shown in our own place of business we cannot expect others to do so. This is also true of signs and outside arcs. We should not start a sign campaign unless we begin in front of our own office.

In handling the financial end of the business a small company frequently has its troubles. For instance, the directors say, "This year you must get along on your profits. All extensions will have to be made from the business." But if new customers are added, or machinery is replaced, it sometimes takes more than the earnings from 1 year, and it is very unpleasant to refuse new business where extensions are necessary, and in the present age gas is being used so generally that it keeps us all guessing to take care of the increases. With the cry of "Cheaper Gas" sweeping over the country, our smaller towns are very apt to contract the disease, and when they do, it is usually in its worst form, and with the least knowledge of the true facts and figures and their proper application. This cry for cheaper and cheaper gas has been bred in some of our so-called "expert accountant's" offices, who figure profits and losses from gross receipts and partial costs, leaving out the principal item of depreciation. This is a large item and must be handled judiciously. In the first place it is necessary to establish a fair length of life for every part of the property. If a part is supposed to last 10 years, depreciate it 10 per cent., if it will last 20 years use 5 per cent., and so on. Deduct this proportion of its valuation each year, and by so doing your account will be charged from the books by the time the article is worn out. If this is done and added to the costs it will show the profits in the gas business as they actually are, which once understood and appreciated will lessen the attacks so frequently made because of the fictitious profits estimated.

Very frequently we are confronted with the argument: "Other cities sell gas for a lower price. Why can't you do it? You ought to make it just as cheaply as they do." It is natural, of course, that people unacquainted with business should not appreciate the necessarily higher costs per unit of a small business as compared with a large one, but it is suprising how often this same cry comes from business men of experience, who might be expected to realize that, in a small gas undertaking, items like the cost of management must necessarily be much greater, figured in cents per 1,000, than in a large undertaking. Careful analysis will serve to show that the great majority of the small gas companies throughout this country are selling gas at a price which is a credit to themselves and should be a source of satisfaction to the public.

Few people stop to realize that gas and electricity have been steadily decreasing in price for the past 25 years, while the price of almost every other necessity has increased, and the cost of all articles entering into the manufacture of gas, including labor, is higher to-day than ever before.

It would seem very strange to some of our large companies if the number of men they employed was as low as 9 or 10, yet 3 and 4 men do all the work at our plant with, only 2 regular fitters. During the summer months extra men are employed for services and mains. One man reads the meters and takes care of gas arcs, while 1 clerk is in the office. This constitutes our entire force and is characteristic of a small company.

Each employee should be made to feel he is a part of the company, and when his services are satisfactory he should be told so. A word of encouragement is worth more than a raise in salary. When orders are given, kindness and consideration will reach much deeper into the the heart of the work than where men work under old-time slavery orders. By this I do not mean that one should be too easy, as this will soon end in disaster, for a great many men will take advantage of good nature, and if offered a finger will take the whole hand; but there is a vast difference between firmness and gruffness.

In conclusion, I wish to say that while we may all have our troubles in both large and small companies, on the other hand there are numerous pleasures and bright days presenting themselves as we go along, and one of the best weeks in the whole year is during the annual convention of our Illinois Gas Association; and I hope we may soon see the membership list include every gas company in the State. It is doubtless unnecessary to go into an argument in favor of State conventions, for the reason that almost without exception every line of business in this country to-day holds its annual convention, either in States or by States, so the question simply resolves itself into becoming a member of one or two good associations. Attend the meet-

ings and get all the good there is in them, both during the sessions and after them, by talking and comparing different methods with members present; by so doing a great deal of valuable information will be received that will help materially in the management of both large and small gas companies.

Discussion.

The President—We have plenty of time for the discussion of this very interesting paper.

Mr. Bramwell—Mr. Negley has covered the ground so thoroughly that his paper admits of very little discussion. One point mentioned cannot be emphasized too strongly. It is that of duplicate machinery or the lack of it in smaller plants. In the larger works it is always found, and generally in these larger works the chance of an absolute shutdown is slight, for there are more chances out of a difficulty. It is rather remarkable that some of us keep running as continuously as we do, considering the fact that we never have more than an hour or two at a time to shut down for repairs. I notice Mr. Negley puts in service pipes free. This question admits of good arguments on both sides, but I believe that our service is more appreciated if it is paid for. The idea of furnishing too many things free gives the impression that the profits on sales of gas are immense and often leads to cheaper gas agitation. We have done away with the idea of giving something for nothing, and believe we get a more appreciative and more responsible class of consumers by doing so. I would like to hear from Mr. Negley as to the statement that it is necessary to be in the office almost every night. It seems to me, while an occasional night's work is necessary, that this is being tied down closer than is needed. The manager must so arrange his affairs that he does not absolutely have to be at any one place at any time, but can adapt himself to what comes up in the course of the day.

Mr. Newberry—I know that the manager of a small gas company in a small town certainly has his troubles at times, as my friend from Lincoln said. This proposition of rendering free service to the public is a mistake. I think oftentimes the public gets the idea that there is an enormous profit in our business from the fact that small gas companies—not only small but large—will render free services into the premises. In the last 3 years the most success we have had has been through charging or the making of a minimum charge of $5 for a service of 50 feet. It seems to me the property owner or the landlord desiring gas into his premises has a certain degree of interest in that proposition, when he has some pecuniary investment with the gas company in common, and I find that the gas is used more frequently when they have some investment and can say to the tenant, here is the gas. I have paid for the installation into the cellar, and as for the stove line, I find the landlord is always a very good booster for the gas company. Everybody knows that a booster is a good thing, for there are plenty of "knockers" among the dear public, and I think it is a good thing to have a few boosters. Therefore, I agree with our friends that a service charge is advisable. Of course, in the larger cities we do not always find the service charge. Chicago, and I believe the towns of Aurora and Joliet, do not charge it, but I think in the small communities it is of value. As to the duplication of machinery in small works, I think it a very good idea. I know from past experience some 4 years ago we thought we were going along very nicely on a 10-horse power boiler. We certainly did the best we could, and whenever the boiler had to shut down everybody got busy and went to it. On a dark night in December, 3 years ago, the whole boiler went to pieces. The consequence was that everybody got busy, but we went aground. The proposition of handling a small gas plant with only one boiler at a time is somewhat difficult. Of course, as I know, all the larger plants have machinery in duplicate, so as to enable them to shut down, clean out and throw in others, and it is a good thing. Taking the small gas works as a whole to-day for the State of Illinois, I think we are getting more to this end. There is nothing further I can add to this paper. I thank you.

Mr. H. S. Whipple—Mr. Negley sets forth clearly and concisely the varied duties of the man who manages a small gas company. He omitted to mention one duty that I have heard one manager performed—of walking about the streets on the last day of discount so that people who saw him would be reminded to pay their gas bills and thus save their discount. I do not think the responsibilities of the manager of a small gas company are any more than are those of a manager who has charge of a large company, but his duties may be more varied. I believe it would pay any coal gas company, carbonizing 1,500 tons or more of coal per year, to put in an ammonia still. It is possible to save from 10 to 15 cents per ton of coal. Where ammoniacal liquor is saved other savings are made which increase, directly or indirectly, the benefits derived from the investment. By subjecting the liquor to a proper settling considerable tar is saved that might otherwise pass off to the sewer. Then, by scrubbing the gas with the weak liquor some sulphur compounds are taken out of the gas, thus relieving the purifiers of some work and reducing the labor of changing boxes. I believe all gas works, no matter how small, should have two exhausters, for I think it pays to keep the holder from landing. I had one experience while managing a works having but one exhauster that I do not want again. I was sending out about 140,000 feet per day, with holder capacity of 96,000 cubic feet, when one afternoon it was noticed that the exhauster was running hard. Through good luck, and other things, we managed to borrow an exhauster from a neighboring gas works. After getting it connected we stopped the old one for about an hour and then tried to start it, but found that, even with 60 pounds of steam in the boiler, and 4 men on the flywheel, it could not be turned. If our old exhauster had stopped before we had the second one connected the city would have been without gas and the company would have lost many consumers and an income that would have been sufficient to have bought several exhausters, besides the right to say: "Use gas, the Old Reliable." Mr. Negley says, to carry pressure at the works sufficient to insure that there will be 3 or 4 inches of water pressure in all parts of the city. To me that seems a rather high pressure; but I believe the tendency at the present time is toward higher pressures, due in a measure to the small mains and services that were laid in past years, and which are not large enough to take care of the increased use of gas in mantle lamps and industrial appliances. In this connection I recall a long controversy, in 1885, about the pressure maintained by the gas company at Columbus, O. The minimum was 14/10, the maximum 22/10, but a reforming doctor, living there, thought the pressures too high by 50 per cent. At that time,

St. Louis	carried	18/10 and 25/10.
Detroit	"	18/10 and 30/10.
Chicago	"	12/10 and 17/10.
Cincinnati	"	18/10 and 30/10.

I believe the better way to increase the weight of a holder is to place the extra weight round the edge so that it will be supported by the angle iron and the sides. I thoroughly agree with him that all wrought iron main and service pipes should be well coated with good paint. I use a paint made of coal tar, tallow, lime and rosin, applied hot to the pipe while the pipe is hot. In this connection I wish to say I have dug up a great deal of 1¼-inch and 1½-inch pipe which, to my own knowledge, was buried for more than 30 years and most of it was in as good condition as when it was laid. It had been covered with red lead and oil. We do not use books for recording any of our orders, but use cards made out in triplicate. They fold into a 4-inch by 6-inch size for filing, the original and duplicate orders going to the shop foreman, while the triplicate is retained in the office. The foreman gives the original order to the workman who is to do the work and retains the duplicate. When the job is completed the workman writes on the order the material and time used and returns it to the office through the foreman. A bill is made out from the original order and mailed at once. The number of the order and date of job are placed on the ledger account of the customer, and the order is then filed numerically. By this system considerable bookkeeping work is avoided. Our complaint tickets are made and handled in like way. All complaint orders that have been returned to the office during the preceding day are placed on my desk each morning. That keeps me in touch with what I consider a very important part of the business. I mark the orders that I think require return post cards, and then hand them to the Superintendent of the Commercial Department, who, after getting what information he wants, hands them to the filing clerk. It is the duty of this clerk, who retains the triplicates, to look over the triplicate complaint orders every morning. If any are found that are 3 days old she calls up the foreman of the workshop and finds out why the originals have not been returned. We do not send out return post cards for every complaint, and file all cards returned in a filing case for future use. And those cards may be of use to us in a day of trouble when our State has a gas commission or we have a "day in court." I agree with the writer that the gas company should have a good and well lighted office—in fact, it should be the best lighted building in the city, both outside and inside. We tell our customers that a well lighted store brings trade. How about our own? We advocate brilliantly lighted windows. Are ours well lighted? And how far into the night? I

agree with Mr. Negley that all gas men should attend the gas conventions, for a great deal of information can be acquired through talking over methods outside of the convention.

The President—If there is no further discussion, I will ask Mr. Negley to close it.

Mr. Negley—The question of free services is quite a large one to discuss offhand. Our practice has been to render free services to the house and stop at that point, but charge for everything on the inside of the house. For my part I think it is advisable to run free service pipes. Of course, there are two sides to it, but it seems to me, when we expect to sell our goods, we must deliver them as all other merchants do. If a person can charge for services consistently, and secure all the business that he wants, that, of course, is an advantage and all right, but I am satisfied in our city we would not sell the gas we do if we had charged for service pipes. We do charge for more than 50 feet, but that covers almost everything, for very few houses are 50 feet from the property. I know some companies that require the consumer to guarantee to use an amount equal to the cost of installing the service during the first year. That is a very good plan, but it is rather hard to enforce. In a number of cases you put in service for a rented house, and the renter will agree to that, but if he leaves there in 3 or 4 months, about all you can do is to let it go, unless he has put up the amount as a deposit, and it is pretty hard to get that. Regarding keeping the office open after supper, as Mr. Bramwell just now suggested, I certainly am not fond of staying at the office after supper, but the idea I wanted to convey was that, in the larger places, almost everyone has a trouble man, or an assistant, or someone to go to the office after supper, and stay until after 8 o'clock, or until the business houses close. In our business, in a small place, the duty usually falls on the manager, to be in the office himself and take care of any complaints. We always make it a rule to stay in the office Saturday nights during the 10 days of our collections, and other nights we are there most of the time, but it is not absolutely necessary that we should be there. Of course, if they don't get in at night they can come in the next day. So we all like to get our work done up through the daytime if we can, but occasionally it is necessary to do a little night work.

Mr. Newberry—I would like to say just a few words in regard to Mr. Negley's paper. I may start something in regard to this proposition with regard to running free services. I am reminded of a conversation held with a gentleman some 3 or 4 years ago, who said, "If the free service proposition is so good, why would it not be advisable to carry this free proposition still further, into the home, install a gas plate, or a gas range, and if you carry it to that extent, why not extend it also to the fixtures and the appliances pertaining thereto." There is no limit to this proposition. The gentleman to whom I spoke some 3 years ago regarding this matter, referred to a company, I believe, in Arkansas or Louisiana, which carried out the idea. He said he thought free installation throughout was a matter that would probably bear investigation. I do not wish to start any discussion, but this is certainly a two-sided question, and I thought perhaps that might bring out some good ideas. If you are going to run pipe free as far as the meter, why not continue a little further if you have money to spend that way?

The President—Mr. Negley, do you wish to reply further?

Mr. Negley—No; I don't believe I have anything further to say.

The President—I am sure I express the sentiment of the Association in thanking Mr. Negley for his interesting and valuable paper. Mr. Roper has an announcement to make.

Mr. Roper—I would like to state that one of our very intimate friends, and one that has always been with us, and one that has always done the work, is now convalescent at San Antonio, that is Mr. Fred. R. Persons. I had a letter from him the other day. He is better and on the mend, and thinks that some day he will able to attend another gas meeting. I would move that this Association instruct its Secretary to telegraph Mr. Persons our congratulations on learning that his health is being restored. [Seconded and carried by rising vote.]

Members Present.

Armstrong, G. H., Waukegan.
Asendorf, C. F., Chicago.
Barrett, W. F., Chicago.
Battin, W. I., Chicago.
Bedard, F. W., LaSalle.
Beebe, T. R., Chicago.
Bennion, L. L., Streator.
Bigelow, L. S., New York City.
Bradley, C. W., Oak Park.
Bramwell, H. S., Lincoln.
Brisely, H. F., Oak Park.
Britsch, M., Oak Park.
Brohl, C., Springfield.
Brown, W. H., Peoria.
Buckley, J. C., Chicago.
Campbell, J. C., Chicago.
Channon, H. O., Quincy.
Chichester, A. A., Chicago.
Chisholm, C. T., Kalamazoo, Mich.
Claiborne, C. H., Baltimore, Md.
Clark, H. C., Oak Park.
Clark, J. C. D., Chicago.
Clausen, W. F., Detroit, Mich.
Cole, S. L., Waukegan.
Connors, M., Chicago.
Court, A., St. Louis, Mo.
Cowdery, E. G., Chicago.
Crawford, E., Sterling.
Crawford, H. T., Waukegan.
Cressler, A. D., Fort Wayne, Ind.
Cressler, C. H., FortWayne, Ind.
Davidson, E. S., DeKalb.
Dawes, H. M., Chicago Heights.
Dawes, R. S., Chicago Heights.
Day, C. L., Chicago.
Eaton, A. B., Chicago.
Edson, N. L., La Grange.
Elder, T. H., La Grange.
Elliot, L. B., Chicago.
Eustace, J. H., Chicago.
Faber, C. O., Aurora.
Featherly, F., Chicago.
Finn, H. J., Chicago.
Fritsch, C. H., St. Louis, Mo.
Fritz, H. C., Chicago.
Garrity, E., Wheaton.
Ginley, J., Chicago.
Goodale, J.C., Jr., Kalamazoo, Mich.
Goodnow, G. F., Waukegan.
Green, H. S., Morrison.
Harper, H. D., Chicago.
Harper, R. B., Chicago.
Harrington, A. S., Chicago.
Hartman, W. E., Joliet.
Higgins, H. C., Centralia,
Hirst, J. B., Chicago.
Houghton, V. A., Aurora.
Hunt, H. R., Chicago.
Hunter, C. W., Chicago.
Hutchinson, W. P., Marion, Ia.
James, F. M., Aurora.
Jenks, R. J., Evanston.
Johnson, L. H., Aurora.
Johnston, E. D., Connersville, Ind.
Kahn, L., Hamilton, O.
Kellum, B. J., Chicago.
Kendall, A. W., Rockford.
Kirby, M., Aurora.
Larson, H. C., Waukegan.
Lathrop, F. A., Chicago.
Lea, H. I., Chicago.
Leakey, N. G., Detroit, Mich.
Light, J. G., Ottawa.
Light, R. G., Ottawa.
Lloyd, A. G., Detroit, Mich.
Luther, F. E., Chicago.
Lynn, J. T., Quincy.
Macy, O. C., Cairo.
Mayer, J. E. J., Chicago.
McColl, R. H., Evanston.
McClary, N. A., DeKalb.
McGwinn, G. D., Streator.
McIntyre, A., Blue Island.
McLaughlin, R. A., Galesburg.
Meyers, J. A., Galva.
Mitchell, H. J., Joliet.
Moore, J. H., Chicago.
Moore, S. H., Chicago.
Morgans, M., Chicago Heights.
Morrell, E. E., DeKalb.
Mueller, R., Decatur.
Murray, A. C., Libertyville.
Negley, E. H., Canton.
Newberry, F. E., Kankakee.
Olds, H. L., Lincoln.
O'Malley, P., Aurora.
Owen, O. L., Springfield.
Owens, J. H., Elgin.
Parker, F. A., Galesburg.
Parker, J. F., Rockford.
Peters, H., Chicago.
Polk, R. W., St. Louis, Mo.
Powers, W. L., Decatur.
Pratt, E. G., Chicago.
Purcell, T. V., Chicago.
Quackenbush, C. H., E. St. Louis.
Rafferty, J. A., Chicago.
Ramsay, D. G., Chicago.
Reilly, J. A., Cincinnati, O.
Reinhard, S. A., Chicago.
Rew, I., DeKalb.
Reynolds, M. J., Anderson, Ind.
Rice, H. L., Aurora.
Robinson, F. E., Aurora.
Roper, G. D., Rockford.
Runner, R. K., DeKalb.
Runner, Z T. F., Freeport.
Russell, D. R., St. Louis, Mo.
Schall, H. D., Detroit, Mich.
Schenck, C., Chicago.
Schmidt, E. G., Springfield.
Seeley, E. J., Chicago.
Seidenglanz, C. H., Rockford.
Sidenstick, E. E, Chicago.
Slimpin, C. D., Elgin.
Smissaert, K. L., Chicago.
Smith, E. W., Kewanee.
Smith, W. S., Chicago.
Smyly, A. L., Chicago.
Speer, R. I., Fort Wayne, Ind.
Steinwedell, W. E., Cleveland, O.
Stratton, S. S., Chicago.
Strohn, C. B., Elgin.
Strohn, R. N., Aurora.
Sweetman, W. D., Chicago.
Unger, J. S., Chicago.
Vaughn, B. W., St. Louis, Mo.
Vilven, F. W., Batavia.
Weber, F. C., Freeport.
Whipple, H. S., Rockford.
Whipple, R. H., Kewanee.
Wickham, L., St. Louis, Mo.
Wilson, W. A., Rockford.
Wilson, W., Chicago.
Wright, E. J. H., Evanston.
Wysocki, J., Aurora.
Yardley, W. F., Evanston.
Ziteowitz, H., Chicago.

An adjournment to 2 o'clock P.M. was ordered.

(To be Continued.)

[OFFICIAL REPORT.—Continued from Page 732.]

PROCEEDINGS, FIRST ANNUAL MEETING, SOUTHERN GAS ASSOCIATION.

HELD IN THE GRUNEWALD HOTEL, NEW ORLEANS, LA., Feb. 18, 19 and 20.

SECOND DAY—MORNING SESSION.

Joint Discussion on the Papers by Messrs. Congdon, Brewer and Rushin.

The Chairman—Gentlemen, these papers are now open for discussion.

Mr. Dunbar—I think Mr. Congdon and Mr. Rushin and also the other gentleman (his name I have forgotten), who submitted the written remarks on the Secretary's paper yesterday, and also this discussion here, have convinced me and likely all of us that these particular people have absolutely the true conception of what the gas companies ought particularly to do; but what they are not doing. I think Mr. Congdon's paper respecting "policy" as regards advertising, strikes me as what a public service corporation ought to do. All public service corporations have rules which, of course, to them are necessary, that are in a measure arbitrary. The public do not under-

stand them. I have done a little compromising with the people who come into our office with complaints that can be readily satisfied. I am naturally tired—sort of lazy; and I don't get all of these complaints. I have had sent to me complaints from certain people who were chronic kickers, to use the word, or who apparently could not be satisfied. I have talked to those people and insisted upon their listening to me when I talk. As a rule, a man is more or less angry or dissatisfied when he comes to you and doesn't listen to your arguments or doesn't know what you said. I have insisted upon that man talking and then listening to me when I talk—allowing me to speak and present my arguments—and I have observed these people and saw it was possible to at least satisfy that man that he was wrong and that the gas company might be right. The public, as a rule, do not understand the necessity for all these so-called arbitrary rules. They don't know, and can't see, why we should charge a man 50 cents a month who doesn't burn anything. They can't understand why we refuse to install a meter unless the man signs an application, and why we make certain charges. They do not see the purpose and reason for every rule that we have; that it is necessary to have rules. I have been contemplating for some time past the publication of a somewhat lengthy article, to be published in the Sunday editions of our papers, and treating one at a time all those particular controversies which come up between some particular individual and the company. I have found out by experiment that I can convince anyone, by getting him alone, that the position of the company is a reasonable position, and that there is a reasonable cause for those so-called ridiculous propositions. You know about the man who said his house was locked up and went away only to come back after a month or two and he had the largest bill he ever had. That man had to be convinced that this was possible and that the gas company could reasonably render a bill for $12 or $15 even when a man is out of his house and has his house locked up. That has happened. We have all had that experience. The man might have let his gas stove run while he was gone. Now we ought to treat the public with these policy advertisements, to convince them just as we convince individuals. So many individuals are dissatisfied, but think it is no use to complain; they have complained before and got no satisfaction, and someone else has complained and got no satisfaction. So we think we can get a world of good by these policy advertisements. My purpose is to do that very thing. So if in a year from now you see that my consumers have petitioned the City Council to have the price of gas raised, or that they have petitioned for a brown stone front for the manager, you will realize that I have convinced the people that they are getting a big and honest value for every dollar we take from them.

Mr. Parker—The manager of a certain plant told me a short time ago that a party and his wife went to California for two months or so, locking up the house, but they were presented with a gas bill of $64 on their return. No one was in the house during their absence. The bill was rendered. Someone came down and protested. The company sent a man out who found they had a water heater in the basement with the cock sticking down below it, and the gas had been turned on in some way and the gas had been going through that water heater two months through this pipe. They could not account as to who turned the gas on or how it happened. This gentleman had a nice bird dog that his brother was to come and get later. During the night the dog ran under the cellar cock and turned it. The brother got the dog and took him away, and for two months the gas came up through the water heater. The man said what are you going to do in this case? I said, I think he will pay it without any trouble. That is just an instance of what will happen.

Mr. Huntting—I believe especially in that part of the paper which lets the public, rather takes the public, into our confidence. I believe we should do such advertising. I wanted to copy that, but was afraid to be accused of not being original. It is a splendid idea to take the public into our confidence and show them just what our business is—what it will do for them and how much they get for their money. It reminds me of a little play I once saw that I will remember for years. It was something like "Brown's in Town," where the man of the family, having an engagement one evening, 'phoned up to his wife that he would be detained in the office and would be late in getting home. His wife found out just about exactly what he was doing that evening, but when he came home she didn't believe the story at all, and he professed the great amount of work he had accomplished, and so forth. Someone put him wise, and the next time he had something of that kind on hand he simply 'phoned up to his wife that he was going to the Arion ball, with a yellow-haired lady of very buxom proportions and of lovely disposition, etc. When he came home the next morning she didn't believe a word of that either. I think if we tell our customers, sometimes, all the real truth, and get them to understand it thoroughly well, we will get on a better basis. They won't believe sometimes just what you say, but if they see it in the public print in an advertisement of this kind they know that we are not going on record in that way unless we have the facts to prove it. Mr. Brewer's paper referred to high-grade solicitors. I am a great believer in high-grade, well paid solicitors. They are the cheapest ones for us. They are the ones we get most money out of. Low priced, low-grade solicitors are worth what we pay them; they are worth nothing at all. Get the right kind of a man and pay him the right kind of wages, and he will earn more than you pay him, while the low grade one will not earn what you pay him, no matter how little that may be. These solicitors go to the public. They represent the gas companies, and if you send a man—a full grown, full size man, like they have them at Atlanta—and the public understands that this is the man who understands that business and knows what he is talking about, and he presents the case in a businesslike manner—if we select a man of capability, the public think of the company as they think of this one particular man, that he represents us, in which way we obtain much through his appearance. If he has the ability to back it up, then we get the business also. We get these high-grade solicitors, educate and train them, have them ready to earn good wages, and then someone takes them away from us; but that is our fault, not theirs. Why should we educate, train and teach them—have them go to their work, then go out and sell our goods, and then let somebody else have them? It is our shame and disgrace that we let them go, for they are certainly worth more to us after we have had them a year or a few months than they are to a new employer, who has to give them some training at least to get them acquainted with the local situation. You can't raise a solicitor, perhaps, or a representative, as they are sometimes known, or gas peddler, or kick agent—you can't raise him in his position after you have kept him there, but you can raise his salary. Every day, if he is worth anything at all, he is worth more, and increases in value day-by-day, month-by-month and year-by-year, until he is known in his territory—until he is applied to and business is brought to him that would not come to a new man that you set in his place. You can't afford to let him go to some other wise company offering a little more money than you are. Get the high-grade man then keep him. One word that I did not expect to find here in one of the papers was the word "dull season." Why, there is no such thing as a dull season in the gas business. Summer, winter, fall or spring, there is always use for a gas stove. If they are going to buy a cooking stove it is going to be a gas stove, where you have live solicitors, and even in New Orleans, when the thermometer is 96°, you need gas to dry out the dampness. We do it in Chattanooga, which is a good deal farther from the water than here. Water heaters; there are no seasons for them. We need hot water in summer and winter, so that occasionally you can take a bath out-of-season, and not wait until the Fourth of July. Enthusiasm has been defined by someone—I disremember the name, but it was in one of our Gas Journals some time ago—thus: A man that is enthusiastic is one who believes in himself and believes in his goods. These two produce enthusiasm, and we have had an illustration of that from the gentleman from Atlanta. There is a man who believes in his goods and in himself too, and that he is able to sell these goods; and I do not know of any better illustration. I think we should be enthusiastic all the time and not just after we have sold a very good bill of merchandise, or accomplished some other good business, then fall down when a man comes in that we have heard so much about in this meeting and kicks about his bill. Our customers should know more about meters than they do. Do we really teach them to have perfect confidence in that instance? Are there not more general managers or companies that are like the one I was first connected with? I was fresh in the business in those days, and noticed those things more than now. The first day I was in a gas office I heard the application and order clerk say to this complaint made by a customer: "I know I have not used the gas;" "We don't take anybody's word for anything; the meter is what we go by." Now, what we have to say to that, is not in that way, and not as that was said and the way it was done. We have to go by our meters. The way I found the best is by the complaint meter, of which we can never have enough around. If you say to a man you will change his meter and test it, what is he going to do? He will go right home and cut off every manner of means of using gas that he can while that test is going on during the next 30 days. If we take in the meter and

he plays that trick, will it show what is what? Take a complaint meter and prove that gas is used by this man and woman who go to bed at 9 o'clock every night and who never turn on the gas until 6 o'clock in the evening—I have 3 cases that occurred within 6 weeks—and our complaint meter proved it. One man alleged that he used gas at certain times, and certain other times, and I proved by this complaint meter that I knew what he had to eat for breakfast and when he got out, and what dinner he had, and what days he had roast dinner, and what time he came in, whether 11, 2 or 4 o'clock. I had him right down pat, and having had experience in this thing so many years, I got him so near right that he could not imagine how I figured it out; but he said, "This is so," and he paid his bill without further question. Another case was in a store. A man objected to the amount of his bill. It ran along and he refused to pay for it, but for want of time, and the complaint meter not being ready, and things like that, it was quite a little while, and when that bill amounted to $135, of course, he was sure that he would never pay us that amount. He didn't know that the complaint meter went in. I don't let them know of it if I can help it. Then they go right on in their usual way. When it came time to show him just how this complaint meter showed us he was using gas, it showed he was using it at 6 o'clock in the morning, when he did not suppose that anybody was there until 8 o'clock, and that gas was being burned at 11 o'clock at night when his store closed at 6 o'clock, and that gas was being burned day-after-day at hours when there was no reasonable cause for it to burn—wh n we showed him that he made no argument, but just turned around and drew his check. When he handed it to me he said, "How did you find it all out?" The complaint meter is a great thing in my estimation. It finds hot plates in the trunks of roomers and appliances of all descriptions in boarding houses and rooming houses, where the landlady knows they all go to bed and put their lights out at 9 o'clock at night. It has been dead sure, and after that those people you have convinced go out and solicit business for you. They see it is a square deal and they give you advertising, but you have to "show them." Just like one man I had trouble with in getting his business away from the electric light company through a dishonest deal the other company made with him. While he would not acknowledge that we were on the square, one evening at the Club, being very mellow, he took the opportunity to introduce the representative of the gas company around to his friends in the near neighborhood, saying, "Here is the honest gas man." That goes everywhere the gas man is and where there is a gas company. These fairy tales about dishonest meters and dishonest managers and dishonest gas men, from New York to San Francisco and from New Orleans to Duluth, have been heard from our grandfathers' time, and they have been told the people over and over again, until the people believe they have had those experiences themselves. They tell you how the meter goes on even when a man is gone to Europe. They shake their bills in your face and say, "We have you dead to rights." We go to the house and probably find the burner still burning. And this goes on every day. But if you take them into your confidence and show them how you can economize in using gas (if they will give us a chance), if we show them how they use it extravagantly, but that, as far as we are concerned, the gas meter is all right all the time, we will have the confidence of the people, and when we get that they will use more gas. But when they are kicking all the time about the gas bill they will use just as little as possible to get along, if they don't cut the meter out altogether.

Mr. Daan—Perhaps a year ago I was sitting at the desk when a complaint came in. A family who moved in from the country brought a gas range and a water heater and three or four gas heaters. The first month their bill was $36. The gentleman was referred to me and he said, "It is your heaters; you had better look after them." It was looked after. It was a mild day, in the month of February, a mild day in a mild State. When we went to the house we found the doors and two windows were open. One or two of the heaters were going and so was one of the burners on the gas range. We asked why the doors were open. They said, "It is too warm." "Why don't you shut off the heat?" "We didn't think of that." There is where much of the gas is consumed by people not knowing when and where to shut it off. I believe one of the best ways of selling gas, along old lines already established, is to have a demonstrator or instructor inject into that instruction some public policy advertising, so that the instructor can go to the consumer without soliciting and instruct those consumers in the use of the gas range or burners in the house, letting the woman of the house learn when to shut off the burner, not only on the heater or the gas range, but everywhere. I think much new business can be secured by instructing the consumer in the proper use of the gas range. I have seen a lot of gas ranges carrying flat irons and a lot of other things in their ovens. I knew a man who had a range for 3 or 4 years and never used its oven in it. If an instructor had visited that woman and talked to her about broiling steak or baking in a gas range, instead of building a fire in a coal range, I think she would use more gas than she does to-day. Another thing Mr. Huntting said that interested me is the retention of the good gas man and not letting the other man get him. I have heard reasons given for not advancing the salaries of solicitors or new office managers, because there was someone else who had been educated there and had been an older man, and had been there longer, and it was thought that to advance a young man over an old man would hardly be fair. The old man had come to the point where he was of very little service to the company; the young man was of great service. It strikes me that merit, and not necessarily the time or the length of time of his service, should regulate the salary of the appliance man.

Mr. Dexter—I want to say a word as to what we are doing in Columbus while we are on the subject of new business generally. Not only in the discussion of the papers to-day, but suggested in the discussion started yesterday by Mr. Huntting, was the negro servant proposition. In Columbus, Ga., we have I believe one of the most up-to-date systems of public schools in the world. We were among the first to adopt the industrial system. We have primary and secondary industrial schools where manual training is taught in advanced degrees. Our public school system was founded by one of the rich men who was prominent in the gas business, Mr. John McIlhenny, a former resident of Columbus, who lived there until the time he moved to Philadelphia. For the past 10 years at least gas cooking has been taught, not only in the colored schools of our public school system, but also in the white schools. It is a part of the regular curriculum of the public schools. All the girl pupils had to take instructions in cooking and domestic subjects, and in three of the schools there are appliances for teacking cooking—hot plates and ranges—and it is a part of the regular course. Especially is that so in the negro schools, and we believe we will accomplish good in the end when the younger generations become of age and become the servants, we will have them all educated in the use of the gas stove. By the way, all our negroes go to school. I think that is one of the greatest problems we have to deal with—this negro question, as Mr. Huntting remarked yesterday, and I wanted to state what we are doing.

The President—I had been trying to make an appointment for the Association to visit the gas works here. I have not been able to so far. You will have to make your own arrangements to go there. Mr. Marshall will be glad to see you at any time. Take the Tulane Belt and get out at the hospital, and if you can't see the holders you can smell them. Out there we will show you the finest assortment of holders—one built in the forties, another in the fifties, one in the sixties, and all three of the same design. The one built in the sixties had the foundation in when Butler entered New Orleans. He ordered the gas company to go ahead and finish the holders. Speaking of Butler reminds me of an incident of the war that I shall relate, which concerns New Orleans particularly. A priest here, and he was a very rank confederate, in the defense of New Orleans had all the bells taken down from the churches in his charge and run into the confederate foundry and cast into cannon. When Butler learned of this man's reputation, perhaps with some idea of getting back at him, when one of his soldiers was killed in a row the priest was called upon to say service over him. The priest sent word he would not, and General Butler sent the Provost guard after him. When he brought the priest before him, Butler said, "Father, I understand you object to say a funeral service of one for my dead soldiers." The priest replied, "General there must be some mistake about that. I would take great pleasure in saying the funeral service over your whole command." Now, on this general discussion I will only say a word or two, for time is very short. Another little incident that illustrates the character of complaints that you have to handle, and the necessity of handling them in a diplomatic manner, and not always getting justice for yourself, sometimes giving more than you should, is: A gentleman was one day here from Chicago who had been all through many claims. I asked him if he had many claims for damages. He said, "Yes, he had a good one." I said, "Give it to me, and I will give you one I settled 2 or 3 years ago, and if you can beat it you are welcome." I said, a lady came to the office, who wanted to be paid for two or three champagne glasses that were broken in her china closet by a rat that the gas company were re-

sponsible for. I said, tell me how the gas company was responsible. She said, "The Company's man bored a hole in the floor, and the rat got up through the hole and into the china closet." I said, "How do you know the rat broke it?" She said, "I saw where the rat had been." We paid the claim, $2.50. The gentleman said, "I believe that beats mine. I had a claim to adjust. We dug a ditch in front of a man's place, and a rain storm that came up he claimed drowned some of his young ducks in the ditch."

Mr. Dean—Mr. Moses requested me, when the invitation was issued to visit the gas plant, that I request all members present who desire to make the visit, to meet him at the gas company's office to-morrow morning at 8:30. We will all go together if that is agreeable to Mr. Miller.

Mr. Congdon—Mr. Frund spoke of the importance of having people read their own meters. In this connection the Golden Rule might be considered. We are very glib in telling people to read their own meters, but I am afraid we sometimes fail to consider the consumer when the meter is installed. We ask a certain woman why she does not read her meter, but if we were to go in her cellar, we might see that she could not possibly read the meter without injuring her clothes or otherwise causing herself annoyance. If we are going to make a special point of urging the people to read their own meters, it seems to me we should take special care that the meters are placed where they can be conveniently read. An objection to the complaint meter for general use is that it is costly to set. We use it as a last resort in settling complaints, and I always have it connected in series with the customer's meter. Contrary to the custom of Mr. Huntting in keeping the presence of the meter secret from the customer. I tell the customer that the meter is there, that I not only want to explain to him when he uses the gas, and bring to light many things concerning the consumption, which he does not know, but I want to demonstrate the reliability of the meter. Recently there was a gentleman in Atlanta who was very suspicious of gas meters. He did not believe he burned the amount of gas that the meter showed registered. I connected a complaint meter in series with this meter, and said to him, "Now Doctor, I am doing this to demonstrate to you the reliability of the gas meter, and the way I am going to do it is to ask you to see if you can fool me." When the week was up I presented the chart, and said, "Now I have a line on you. Ask me some questions." He said, "What did I do Sunday?" I replied, "I do not know what you did all day Sunday, but as far as your gas consumption is concerned, you did not burn any gas until 4:30 in the afternoon, and then you did not use it for more than 15 minutes. During the rest of the day no gas was used." I think work of this character tends to increase confidence in the gas meter, and I believe the work for good is not only accomplished with the man in whose home the complaint meter is installed, but he teaches the lesson to his friends. In considering the matter of a gas bill, and endeavoring to look at it from the customer's point of view, we should try to imagine that we are the customers and are looking for justice from the gas company. In trying to be absolutely fair, I endeavor to consider all the elements that go to make up the amount of the customer's bill. The accuracy of the meter and the reading of the meter are not the only factors we must consider, if we wish to fulfill not only our legal, but our moral obligations. We may be selling gas claimed to be of certain candle power, or of certain thermal value. If we send out an inferior quality of gas during a portion of the month, and below standard, more gas, of course, will be used during this period, if the same work is required, and the gas bill will be correspondingly and unduly large. It is to our, and the customers', interest that we supply gas of as nearly a constant quality as possible. In placing the meters we should try to install them where the temperature will remain as nearly as possible constant. Do not put them on the back porch, where the sun will shine on them during the hot summer months, and do not place them close to furnaces, where the gas will be expanded owing to the source of heat. We should try to consider all of these little points, and treat our customers the way we would like to have them treat us under similar circumstances. A customer in making application to us for gas, does not in his application state that the gas must be delivered to him at a constant temperature at his meter, at a constant thermal value, or a constant pressure. The form of application in Atlanta, and I suppose it is the same elsewhere, is, "I agree to buy gas from you in accordance with the meter reading." Under this contract, when you have read the customer's meter accurately, and have supplied him with an accurate meter, you have fulfilled your legal obligation. When you satisfy yourself that the meter is accurate, and that the reading is correct, I think the point then is to convince your customer that you have fulfilled your obligation; that you have kept your contract. Having taken this stand, and having shown him that you have fulfilled your obligation, then, as a matter of courtesy, good feeling and generosity, you will say, "I will help you all I can, and see if we cannot enable you to economize in the use of gas." Try to impress the customer that this is a favor you are extending, and not an obligation you are endeavoring to fulfill. Explain that you particularly desire that all of your customers shall be satisfied. When you have treated a customer as above described, and the demonstrator has made visits of instruction, you will then not only have done a good part by your fellow man, but you will have advertised gas and your company, and this, I believe, to be the very best kind of publicity work. The gentleman Mr. Rushin spoke of, who thought the clock required gas to make it go, is a reporter on one of our daily papers. I told this gentleman, "When I get through with you, you will be one of the best gas advertisers our Company has ever had." In writing letters in answer to complaints, I usually close by saying, "If this letter does not clear the matter to your satisfaction, kindly let me hear from you again."

Mr. Frund—A method we follow is to furnish the consumer with a small diagram of the meter dial. We wish them to became acquainted with and to learn how to use it in reading the meter, to watch the clock, etc. We inquire of them if they know how to bake, or to take moisture out of the roast, and see by the watch meter how much gas is required to do it—to do a certain amount of baking. In that way they reduce their bills. Or we get them to see how much gas it takes to boil a pint of water, until they know just how much it takes for any particular work.

Mr. Kellum—Mr. Frund's statement suggests something by which we might get valuable advertising. Why is it not possible to get up a mechanical contrivance that you can hitch up with the meter in the window, and every time you use 10 feet of gas it would drop a penny; then have an appliance showing how long it had been running, and thus the public coming up would be able to see from the amount shown by this little device how much gas it would burn and how much it would cost. It seems to me that would be of some value.

The President—I think the Welsbach Company should do that and put it on its light. I will put my man to work on it now and sell you the patent.

Mr. Parker—I would call the attention of these gentlemen to the paper read by Mr. Rushin. It has been a great pleasure to me to hear a good many papers on new business, but I think there is more meat in that paper than any other I ever heard. You really don't know what is in it until you see it printed. It covers everything, and shows what the commercial end of the business means to the gas company. I am going to supply myself with as many copies of that paper as I can, to leave with gentlemen I know would like to have it.

Mr. Rushin—I want to ask a question. One thing happened yesterday, and if I did not learn anything else before I left New Orleans, one, which I learned yesterday, will benefit me enough to pay for my trip here. It is to get the bill from the bookkeeper before it gets to the consumer and let the proper man go there and show the bill, if it is a large bill, and ask him what he thinks about it. Don't let him come to you. Otherwise he will think there is something wrong. Have an intelligent man go with the bill and say, "Here is a bill larger than the previous month, or any bill you have ever had since you have been using gas, and we want to know what is the matter, and demand of you to know where that gas went to." I want to know if a majority of the people here don't think it is a good idea? I would like to hear from someone to-morrow. I have done it in a few cases in Atlanta, but, as far as I was concerned, I was unconscious of the fact that I was doing it.

The President pursuant to motion declared an adjournment until 10:30 o'clock A.M. of the next day.

THIRD DAY—MORNING SESSION.

Vice-President Congdon called the meeting to order at 10:30 A.M.

NEXT PLACE OF MEETING.

The report of the Committee on Next Place of Meeting was called for, and the Vice-President, speaking for the Committee, said the decision favored Chattanooga, Tenn. [The decision was ratified by vote.]

Mr. Hagerty, from the Commitee on Badges, submitted the design, executed by Mr. Whittaker, and asked that it be selected as the official and permanent badge—an enlarged design of the badge was displayed on the wall back of the President's desk. [Carried.]

The Vice-President introduced Mr. R. M. Redding, of New Orleans, La., who read a paper on the

OILS AVAILABLE FOR THE SOUTHERN GAS MANUFACTURER.

[For the text of the paper, see JOURNAL, *ante*, p. 686.]

Discussion.

The Vice-President—The paper is now open for discussion. Mr. Evans, we would like to hear from you on this subject.

Mr. Evans—I would like to ask why the Welsh field shows up first? Have you made very many tests?

Mr. Redding—Only covering a week. The results were not very satisfactory, as we did not get the candle power.

Mr. Miller—It is almost impossible to handle the Welsh oil. We had not quite a full car, which was being shipped to Mobile. When they found out what it was they stopped it in New Orleans and asked us to take it. We did so merely to find out something about it.

Mr. Evans—Is the Welsh field a large one?

Mr. Redding—No; small. About all the fields in Louisiana, except those in Caddo, seem to be on the decline.

Mr. Miller—Mow about the Butte field?

Mr. Redding—It is about the same as the Welsh field. The samples I have here are: Ame-la-Butte, 18.4; Breaux Bridge, 17.9; Welsh, 20. So the oil from these three fields runs from 17 to 20. It seems to carry a good deal of asphalt. Ame-la-Butte has about 10 per cent. residue, as against 7 or 8 per cent. for the lighter oils of other fields.

Mr. Evans—Does the Jennings oil give a better candle power than the Caddo oil?

Mr. Redding—Of course, Caddo oil has not been used as much as

the other oil. Our experience so far shows better candle power from Caddo oil than from any other. It is almost pure paraffine oil.

Mr. Curtis—It might be interesting to the gentlemen present to know about the marked difference in the gravity of the oils found in that field. At the present time there is a distinct demarcation in the fields in which the two gravities of oil are found. The general trend of the field is from northeast to southwest, but the line is almost east and west—to the north and west—that marks that location.

Mr. Miller—Is that heavier oil toward the eastward or westward of that line?

Mr. Curtis—Northeast.

Mr. Redding—Do you find any indications of sulphur deposits in those fields?

Mr. Curtis—So far, I have learned of none; the drill has not discovered any sulphur at all so far as I know.

Mr. Redding—That would probably throw some light on the character of the oil. Sulphur deposits in Louisiana are supposed to be traceable to the same cause as oil deposits. The theory has been that the sulphur fields are due to the same sources or causes as the oil fields. The theory is that the diatoms have secreted oil and also sulphur, and that convection currents and other forces have segregated these deposits, giving us the pure sulphur deposits for which Louisiana is noted.

Mr. Curtis—We found shells resembling oyster shells; the diatom I think has no shell. It is a very minute organism, and is found not only to contain oil, but that it was capable of separating the sulphur. You find plenty of salt water there.

The Secretary—I am going to ask a question or two about it. In Indianapolis they had been using naphtha, but changed to Lima crude oil, and immediately trouble commenced. The trouble was of the gas. It would almost go out. I was one of those sent out to see what the matter was; I found a deposit of gummy oil on the meter valves, sufficient to almost stop them. The gas would almost go out then come up again. Has anyone had experience of that kind in the use of Texas oil. If so, what measures were adopted to obviate it? Talking about residue, I did not catch the definition altogether in the paper read. Is the residue something with a uniform proportion of carbon; if so, what percentage?

Mr. Redding—The general term residue amongst the oil men, and also used by the Standard Oil Company, is that percentage remaining after fractionating up to about 700° F. In some oils it may be a cake-like tar. As a rule you cannot fractionate the average oil much above 700°, even to 750°; some, but not many oils will go above that. We have gotten practically everything that will distill at 750° F. As to the other point, the trouble in Beaumont may have been due to the fact that the superheater did not fix the hydrocarbon thoroughly. Possibly the heat was not high enough to convert the vapors from that state to a gaseous state, and on cooling they have been condensed down. In these light, tarry, compounds you might find that some matter was carried along, making a sort of gummy mixture, that might not have been due entirely to the oil.

Mr. Osbourne—I want to reminisce a little bit. As to the matter spoken of by Mr. Ferrier, we had quite a little trouble when we introduced crude oil after having first used naphtha—very nice oil to handle. The chances are Mr. Ferrier's trouble came from the fact that he went right into the crude oil after using the higher or lighter oil, or one that did not require as high heat as crude oil. The moment he began to use crude oil a good deal of it got away or was carried out, and he got a deposit along with it. When we first began to make water gas the juice would fly out. We got over that after a while, and I don't think any trouble like that bothers the fellows who are making water gas these days.

Mr. Moore—Using Texas oil, the experience of the San Antonio people has been that they block the carburetter and superheater entirely. On one occasion I found that we did not get right results. Our gas makers were running along just as they had all the time. I myself stood around and watched, and very soon found they were making fine coke out of their oil. I had to pull out all my checker-brick to rechecker and make them hot before I could get results. So it is not altogether a question of too low heat; it may be a question of too high heat. You have to keep along about a proper temperature all the time or you will have that result. Such has been my experience with Texas crude oil. Texarkana oil is not so difficult; it is a higher grade of oil. If you should hold the heat too high, you will certainly form coke instead of gas. I would like to hear from someone else in reply to Mr. Ferrier's question a moment ago as to gummy valves. In getting the heat too high we also form coke which prevents the proper action of heat upon the oil; a very heavy, gummy substance forms at the same time. I don't know what it might be properly called.

Mr. Redding—The point I was trying to get at is whether the heavy product is carried out by the gas and deposited in the gas burners, etc.

Mr. Moore—Carried in the oil in your main. It has occurred. At one time all my arc transfers were stopped up by having the heat too high. We got a gummy substance that I could not properly name.

Mr. Redding—Would you call it a heavy tar product? Would it stay up so that it could be carried?

Mr. Moore—It gradually filled up.

Mr. Miller—I think that that is a question largely of condensation in the plant. In an experience here one winter our Welsbach burners were stopping up as fast as we could clean them out, the stoppages occurring only in that section of the city supplied by gas sent out under high pressure. An examination of that material developed a pretty good grade of asphalt varnish on the burners. The moment you got heat on these deposits they dried out into a hard scale, and in the parts of burners that did not get heat it would be there in a gummy deposit like japan. It occurred in no other portion of the town except where gas was supplied by high pressure service. After working with the thing for some time we discovered that there was a certain amount of condensation in the high pressure main, which would accumulate and be carried through the governor into the low pressure main. The gas, on being released from the pressure, took up some of this, but did not incorporate it thoroughly, and it was again stripped out at the check in the burners.

(To be Continued.)

Bureau of Information, The American Gas Institute.

Under the direction of the Institute it has been decreed: 1. That the privilege of submitting questions be limited to members of the Institute. 2. Neither the Board of Directors of this Institute, nor the Institute as a body, make themselves in any way responsible for the statements of fact or expressions of view given out by the Bureau of Information.

BUREAU OF INFORMATION, THE AMERICAN GAS INSTITUTE,
HEADQUARTERS, 1943 COMMERCIAL NATIONAL BANK BUILDING.
W. A. BAEHR, Chairman. CHICAGO, ILLS., April 23, 1909.

The following, from the Bureau of Information, has been forwarded by Chairman Baehr:

Question No. 29.—"Does very rapid condensation tend to reduce the permanent illuminating power of coal gas? Experience shows that the illuminating power of coal gas, when condensed very slowly, is considerably higher at the works than when the gas is condensed very rapidly. In the latter case, however, there is apparently much greater loss of illuminating power in distribution, especially in cold weather, due to the condensation of the heavier hydrocarbons. It is evident that it is possible to install gas condensing apparatus costing less than half what the approved apparatus costs, but in which the work would be done very rapidly and also very efficiently so far as the use of cooling water is concerned. Would the use of such apparatus result in an appreciable loss of illuminating power at the consumers' burners as compared with the use of the present approved types of apparatus?"

ANSWER BY THE BUREAU OF INFORMATION.

The question as stated partially answers itself. In other words, it premises that rapid condensation itself reduces the initial power of coal gas. The question, therefore, resolves itself into this form:

"Is there an appreciable loss in the illuminants in distribution, especially in cold weather, due to the condensation of the heavier hydrocarbons in the coal gas where the gas has been condensed very slowly at the works, and to a high minimum temperature, than that to which it is subjected in the distribution system?"

At Station A plant, in Detroit, where the test was conducted, we had the usual type of condensing apparatus employed in a coal gas plant. The primary condensers reduced the temperature of the gas at the inlet of the exhauster to 120° F., the secondary condensers reduced the temperature of the gas at the rotary scrubber to about 70°. The introduction of steam at the outlet of the rotary scrubber raised the temture of the gas at the inlet to the purifiers to approximately 100°. For purposes of testing two small holders installed, one taking an average sample of the gas at the inlet to the meter, the other taking an average sample of the gas at the inlet to the meter after it has passed through a long line of small pipe exposed to the atmosphere. Eighty tests were taken, using Carpenter's Metropolitan No. 2 Argand burner for candle power tests, and Junkers' calorimeter for determining the heat units, with the following results:

Holder Test.	Candle Power.	B.T.U.'s.
Unchilled gas	18.48	636.8
Chilled gas	18.01	632.1
Drop	00.47	4.7

The average atmospheric temperature during tests was 29° F.
A series of line tests were run with the following results:

Holder Test.	Candle Power.	B.T.U.'s.
Unchilled gas	18.87	—
Chilled gas	18.62	—
Drop	00.25	—

The average atmospheric temperature during tests was 27° F.

From this it would appear that, under the conditions named, the illuminants were pretty well fixed.

Question No. 48.—"What are the comparative merits, in the case of large companies, of making meter repairs under a 'piece work' schedule as compared with strictly 'day work?'"

ANSWER-AT-LARGE, BY CONTRIBUTION.

The question of piece work or day work to be established in any meter repair shop is dependent, primarily, upon but one considera-

tion—the quantity of work in hand to busily employ at fixed tasks the employees engaged. A man working piece work cannot produce results if his piece work is spasmodic and broken into by hour time work, or day work, or to the same extent interfered with while waiting on material or meters to be handled.

Under this condition, with the majority of the smaller gas companies, it is much more preferable to work with one or two men in the meter repair shop, on a day work or hour work principle, in that the repair men, who are generally more or less mechanical, can be used on a great variety of other work, and in this manner be much more liable to earn their wage for the employer.

On the other hand, with a large shop where continuous quantities of meters are being handled, the piece work system is unquestionably the better, as there is no doubt that the introduction of piece work rate, sometimes accompanied by premiums or payment of bonus, particularly for good workmanship, etc., will create from the start a general "quickening" of all employees; this characteristic "quickening" is readily recognized and is of itself the best indication that more actual work can be accomplished in a large well organized shop under the piece work system per unit of time than under any system of day labor.

In the handling of piece work organization, it is well to give consideration to several essential points. As stated, the undertaking must be of sufficient magnitude to constantly employ the men engaged in the actual repair of meters. Again, the supervision of any meter repair shop, particularly when working on a piece work basis, must be strict and exacting, and yet at the same time, this supervision must be in sympathy with the object sought; namely, the lowest possible labor cost consistent with good workmanship—and at the same time consistent with a fair remuneration to the employees—and, again, the supervision or direction of the actual operation of a meter repair shop, particularly under the piece work system, should be intrusted to a man with good knowledge of the work to be accomplished, and who is enthusiastic, optimistic, without ideal dreams; and, above all, the man should be practical to the extent of having had some knowledge of the detail of the actual work to be performed.

This question of superintendent is a thought to be dwelled upon, as a man in this position, to obtain good results under a piece work system, must be resourceful in adapting the work to whatever system may be installed; at the same time he must be tactful in dealing with his employees, and, to a degree, must accept their viewpoint, and yet mould same to his own advantage as well as to the advantage of his employees.

He must have a keen appreciation of fairness and truthfulness, and its value to him in maintaining his position with his men, especially as a piece work rating is merely a refinement of the old-style, set-tasks for different men. The operation under piece work is really the introduction of the right prices for the right tasks, both to be equitable, not only to the employer but to the employees as well.

Question No. 25.—"What rule and method should be followed in designing condensers to remove condensation resulting from compression of gases?"

ANSWER BY BUREAU OF INFORMATION.

This is a question on which present information is not sufficient to allow a thoroughly definite answer to be made. As far as we were able to ascertain, no work has been done on determining the results of condensing high pressure gas to ground temperature at the point where it is compressed. The practice has been to have this condensation take place in the pipe line, one advantage of which is, that with some of the oils the condensation dropped on one day, at a high pressure temperature, will be picked up at a later day at a different temperature. This may not be considered an advantage on account of its irregularity and certain loss of some of the oils. If the gas is condensed within the works, the oils can then be retained, and a corresponding value of their oil can be introduced at the point of delivery for re-enrichment. Certain general assumptions of the problem can be presented, however. The amount of condensing surface necessary to reduce the temperature of the gas can be mechanically determined by figuring the number of heat units to be abstracted, and there is not much trouble, therefore, in bringing the temperature of the gas down to a point to condense the moisture. Given the maximum compression and the lowest ground temperature, the sizes of the necessary condensers can be readily determined.

The real trouble, however, is to remove the condensation. In low pressure the gas flows at a slow velocity, which moisture readily settles in the bottom of vessels, and is drawn off. In the case of high pressure gas, the high velocity of the gas carries this condensation along, sometimes as a fog, and again in frictional contact with the sides of the mains. The condensing surface designed when a high pressure system is first installed, and the flow of the gas slowly, may be adequate, but as the business increases, and the velocity through the main increases, the system becomes inadequate. High velocity may not be a disadvantage under certain conditions, as through it the removal of all condensate ready to come down can be affected like the removal of water from steam. It would appear, therefore, that high pressure condensers should be arranged to abruptly change the course of gas at frequent intervals, and at those points where condensate will be shaken out, provision should be made for the immediate removal of the condensate, as is done in the Cochrane steam separator.

There is a difference of opinion as to the velocity question. Some think that the condensing chamber must be large enough so that the flow of gas through it is comparatively slow. Recent experiments have indicated that it is possible some oil condensate may be precipitated by the water condensate, and that, could this dragging down of the oil by the water be prevented, the total oil condensate would be much reduced.

This is wholly a matter of guesswork at present, for there is no conclusive information as to what the total oil condensate should be under various conditions; but it would seem desirable, for the present at least, that the water condensate be drained as quickly as formed. A possible type of condenser that suggests itself is the type used in ammonia practice, the high pressure gas to be sent through a series of tubes, surrounded by cooling water. Quick and frequent reversal of flow could easily be arranged in such a condenser.

Up to the present time it has been thought that high pressure pipe lines need not be laid very deep, as there was so little danger of stoppage from frost. This ignored, however, the danger of condensing the oils, and it is now known that shallow pipe lines for high pressure gas tend to produce a heavy deposit of hydrocarbon oils just as do shallow pressure lines. The low pressure that may be experienced in such pipe lines, when the ground is thawing, and the results therefrom, may be found set forth in the recent paper on this subject before the Illinois Gas Association, indicating the low limit which a works condenser would have to meet, if no after-precipitation were to be expected in such a pipe line.

This whole question is entirely in its infancy, and investigations, especially on the question of re-enrichment, and experiments along the lines of works condensers, would be very desirable. Reference is made to the paper above before the Illinois Gas Association, which is the first paper of investigation before any of our Associations on this general topic.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. LESLIE P. ROSS, the go-ahead Business Manager of the Superior (Wis.) Water, Light and Power Company, in a communication recently to hand, says: "Having noticed in the paper read by Mr. Philmer Eves (and published in your issue for March 15th) before the Indiana Gas Association, in which he stated that, during a series of cooking lectures in Indianapolis the total attendance was 2,796, I thought that it might be of interest to your readers to know that, during the second week in April, Mrs. Helen Armstrong, of Chicagof conducted a course of 6 lectures in our salesroom, in the interests of the Rathbone-Sard Co. and ourselves, the total was 1,392. I think this exceptional in a town of 45,000, to about one-third of which only gas is available."

MR. H. M. MOORE, Manager of the Austin (Tex.) Gas Light Company, writing under date of April 25th, says: "In your report of the Proceedings of the First Annual Meeting of the Southern Gas Association, published in your issue of April 12th, you have my remarks on Mr. Ferrier's paper, 'Competition and Regulation,' badly garbled. You make me say: 'We proposed that he should pass another bill instead, making the consumer pay our bill whe ther correct or incorrect; that it was fair.' I never made such a statement. Such a proposition is absurd on its face. What I did say was that we proposed a bill that was absolutely fair to both sides, providing for a public inspector of weights and measures, who should inspect and test our meters in such cases, and certify to the consumer and the Company his findings. In case the meter tested correctly, or within 3 per cent. correct, the consumer should pay the inspector's fee; and in case the consumer still refused to pay his bill, we had to give 5 days' personal notice that the meter would be removed. Again, you quote me as saying: 'We defeated the bill, and two years ago we had a bill that they would not allow us to make any rates, but would allow us 10 per cent on our property.' In this case I said, 'We defeated the bill several times, but two years ago we had it rewritten and attached an amendment to it that provided that City Councils could make no rate that would not allow us to earn at least 10 per cent. on our investment, and that at the present session there was a proposition to amend the bill on lines satisfactory to us, but eliminating the 10 per cent. clause. I trust you will publish this correction, for the remarks as published must look foolish to anyone."

MESSRS. W. N. COLER & CO., of New York, have secured control of the Greensboro (N. C.) Gas, Electric and Street Railway Company, and Mr. E. S. Deal has been appointed General Manager. Mr. J. K. Russell, who is actively in charge of the gas plant, is engaged in planning extensive additions to the main system. The scheme, in fact, calls for the placing of 12 miles of pipe running from 6 to 10 inches in diameter. The Company also is considering the advisability of piping gas to High Point—which spot is known to every owner of

bird dogs in this country, and Europe as well, as the place where the annual field trials are had. The pipe to High Point will be of the high pressure type. The Company will in all likelihood connect Greensboro and High Point by means of a modern electric railway line. The distance is 16 miles. Mr. Russell and his Company certainly propose to cover thoroughly the way and means of securing new business, judging from the layout above detailed. Come to think of it, this story certainly goes to show the great strides that are being made on general business account in the South, especially in the Carolinas, many of the settlements of which are coming into prominence with great strides. Nor could this long deferred movement be forever delayed, since the country in the named region has natural advantages second to none in the States—beauty, fertility, equable temperature and almost perfect natural drainage.

MR. F. V. ARNOLD, writing to us from San Francisco, Cal., under date of April 23d: "The following little incident (little to the ordinary world, but tragical enough to the Warquarht family) goes well to show how careful one should be when handling or using the most ordinary and well-known appliances in the household. A widow named Warquarht, who was in her 60th year, resided in the premises No. 1622 Geary street, San Francisco. Although at that age she lived alone, save for the companionship of a small dog. She slept in the back parlor of the house, the other rooms having been rented by her to lodgers. A small gas heater, without flue connection, was used to keep the atmosphere of the room at a proper temperature, the heater being connected to a wall-bracket gas fixture by means of an ordinary hose of the type usually employed in the circumstances. The night of the 20th ult., Mrs. Warquarht retired to bed, at perhaps 11 o'clock, but instead of turning off the gas at the fixture she shut off the valve on the heater. Next morning one of the lodgers detected the odor of escaping gas and traced it to the parlor. Receiving no response, the door was forced, and the widow and the dog were found in an unconscious state, and the gas filled room was sufficient evidence of the happening. A glance at the bracket fixture and the stove was sufficient. Evidently the dog awoke early and finding that his mistress was not awake commenced to play around the room. In his movements the hose attracted his attention. Finding it yielded to his teeth, gnawed it a bit—the disjointed end was well bitten up—or until it became detached. And there the story is told. Both woman and dog subsequently died in the Central Emergency Hospital. The lesson taught by this is the old one that many people will seemingly never learn. And that is this: Never fit a gas stove with or to a connection that feeds or can be fed from both fixture or apparatus."

THE rate question in Washington, D. C., seems to have been happily settled by the proprietors of the Washington Gas Light Company, who, after a lengthy session of the Board of Directors, announced last Monday that, on and after July 1st, the net selling rate of 90 cents per 1,000 cubic feet would prevail. It is likely that this concession will put an end, for quite a period at least, to all efforts on the part of Congress to fix a rate that would mean hardship to the Company.

MR. HARLAN S. MINER, of the Welsbach Lighting Company, of Gloucester City, N. J., was the lecturer some evenings ago at the College of New Hampshire, Durham, N. H. His subject was the "History of Incandescent Gas Lighting," and his theme was portrayed in excellent speech. Notable in the story was the description of mining for the monazite sands, and well supplementary thereto was his account of how the mantle is manufactured. He was assisted in his lecture by Mr. C. A. Dodge, a graduate of the College, who handled the lantern slides with telling accuracy.

THE Municipal gas plant, Wakefield, Mass., will soon be in the market for the construction of a gasholder. It is also likely that bids will be asked for the construction of a new bench of 6's, for a station meter, and for considerable extensions to the main system.

AT the annual meeting of the Bridgeport (Conn.) Gas Light Company the officers elected were: Directors, I. De Ver Warner, De Ver H. Warner, Chas. F. Dieterich, A. B. Proal, Goodwin Stoddard, A. E. Dieterich, F. B. Nairne, N. W. Bishop and James C. Brady; President, I. De Ver Warner; Vice-President, De Ver H. Warner; Secretary and Treasurer, Geo. W. Roberts.

MR. JOHN MCMILLAN assumed his new post, as Superintendent of the Portsmouth (O.) Gas Company, last Saturday.

CAPTAIN C. F. DUNCAN, Manager of the Princeton (Ills.) Gas Company, has been authorized by the proprietors to announce that hereafter the selling rate shall be $1.50 per 1,000 cubic feet, less 25 cents per 1,000 for prompt payment. This is an all-round concession of 25 cents per 1,000.

A CORRESPONDENT in Detroit sends the following under date of the 24th inst.: "Early this week the Men's League of the First Presbyterian Church, of Adrian, Mich., held a rather interesting meeting, even if the matter mainly heard was the thoroughly carnal subject of 'Gas and Electricity.' Mr. Victor F. Dewey, of Detroit, a former Cambridge boy, and graduate of Adrian College, who is attached to the engineering staff of the Detroit City Gas Company, gave an interesting speech on that occasion, on 'Gas,' which was well illustrated by lantern slides and charts. Then an equally interesting speech on 'Electricity' was made by Mr. Henry Fee, of the Citizens Electric Light and Power Company, which was also profusely illustrated, if I may so write. Then followed musical selections that were well rendered by the High School quartet, a cornet solo by J. W. Kirk, and a vocal solo by G. Gibson. There was a 'heavy attendance' and 'light' refreshments were served in conclusion."

MRS. HELEN ARMSTRONG, writing to us recently, remarked: "We had excellent success in the demonstration series at Terre Haute, Ind. The lectures were delivered to large audiences, who expressed great interest in the display of apparatus maintained by the Company. Much interest was shown in the new styles of cabinet ranges."

MR. J. D. TAYLOR, the up-to-date Manager of the Wausau (Wis.) Gas Company, was pretty well pushed last winter in attempting to keep up with the demands of his customers, from a plant not up to the situation. Early this season, however, he was in the field for estimates for considerable bench work. The successful contractors in this instance were the Gas Bench Construction Company, of St. Louis.

WRITING of bench work construction puts us in mind of the fact that the Parker-Russell Manufacturing Company, of St. Louis, Mo., has been making its mark in this section of the country rather pointedly of late. In support of which we may note orders now on their books for bench work in the East. Current items on their books include: Refilling 2 benches of 6's, at Annapolis, Md., and like work for these places: New Bedford, Mass., 2 full-depth 6's, inclined, 20-inch retorts; Lockport, N. Y., 1 bench half-depth 6's; Fulton, N. Y., 1 half-depth 6's; Tonawanda, N. Y., 2 open 5's; Norfolk, Va., 2 half-depth 6's. Other Eastern orders just finished were: South Norwalk, Conn., 2 benches, 6's, half-depth; Willimantic, Conn., 2 benches, 6's, half-depth; Ottawa, Canada, 5 benches, half-depth 6's. Mr. Parker reports that many gas works managers are seriously considering betterments, which the proprietors admit are needed, but about the awarding the contracts for which they are unaccountably if not unreasonably slow in making. Such tardiness always results in a rush for goods and apparatus in August and September that should have been booked for delivery and completion the preceding April and May. And another certain thing about the "rush" is the August and September orders will all have to be delivered in either September or October. Wake up to your needs, Messrs. Proprietors.

THE residents of Elizabeth City, N. C., are loudly proclaiming against the plan of the projectors of the Elizabeth City Gas Company to locate the plant at the foot of Church street. The main objection is the propinquity to the site of the First Methodist Church.

"V. W. G.," writing from Cambridge, Mass., under date of the 24th April, says: "I failed to find anything in the JOURNAL respecting the fourth annual entertainment of the Employees' Benevolent Association of our local Gas Light Company, which is certainly one of the best benevolent societies in this city. The annual entertainment this year was a great success. It included a concert programme, notable in which were expositions of Scotch and Irish dances, popular songs and a recitation or two, all of which were hugely enjoyed. Dancing of a general nature concluded a very entertaining evening. During intermission an excellent dinner was served. The guests included Messrs. William A. Bullard, Albert M. Barnes and John P. Kennedy, respectively President, General Manager and Superintendent of the Company. The Association was formed in 1904, and during this period it has paid out on account of benefits to its members on all accounts of quite close to $1,500. The officers of the Society are: President, Robert Law; Vice-President, John Brennan; Treasurer, P. Donahue; Secretary, Jno. J. Crowley."

MESSRS. G. E. OSTROOT, Jno. M. Thompson, J. C. Orland, Thos. Sullivan and J. C. Sheyer have taken over the gas franchise recently granted to Messrs. W. A. Clark & Co. at Moscow, Idaho. They propose to construct at once.

AT the annual meeting of the Lambertville (N. J.) Gas Company the officers elected were: Directors, T. Congell, J. Lily, F. W. Van Hart, A. D. Anderson, G. L. Romine, George W. Massey and W. Lilly.

The Market for Gas Securities.

Dullness to the extreme was the record in Consolidated gas last week, but holders would not sell at the figures offered by bidders. This is a right good feature in any sort of trading market. The Cortelyou regime is noted for one thing, and that is absence of precipitancy. It is a strong point, too; for undue haste has led many a one astray. We understand that this month so far has proved a record breaker in respect of sendout for the fool's month. This goes, too, in so far as the electrical output is concerned. We repeat our advice as to the importance of the cheapness of both Consolidated and Brooklyn Union at current prices.

Peoples, of Chicago, has been quite active, likely on account of profit taking by those who purchased on the way up from 80. The Company as a 7 per cent. dividend payer may be reckoned with safety for a period of at least 5 years. Massachusetts shares are going up serenely; and Washington (D. C.) gas may be counted on to go to about 500, now that the selling rate has been put voluntarily at 90 cents. The bond market continues strong.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

MAY 3.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated Gas Co.	$73,177,000	100	137¼	137⅝
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	98	101
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	37	42
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	100	101
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	130	135
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91⅛	92
Yonkers	999,650	500	130	—
Out-of Town Companies.				
Bay State	50,000,000	50	1¼	1¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	60	60¼
Capital, Sacramento	500,000	50	—	85
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	105½
Cincinnati Gas and Electric				
Co.	20,500,000	100	92	93
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75¼	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	458,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	981,000	1,000	75	80
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,225,000	1,000	104½	106
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	103	103½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	—	100
Preferred	2,500,000	100	60	90
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	350,000	1,000	106	106¾
" 6 per cent. scrip,				
due 1910	100,000	25	60	60¼
Massachusetts Gas Compan-				
ies, of Boston	25,000,000	100	63¼	64
Preferred	25,000,000	100	93½	94
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	115¼	115⅝
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	104
Washington (D. C.) Gas Co.	2,600,000	20	355	357½
1st Mortgage, 6's	600,000	—	—	—

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(*Continued on page 790.*)

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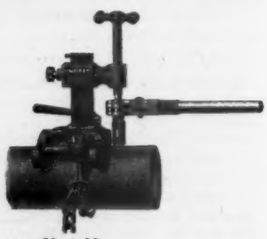

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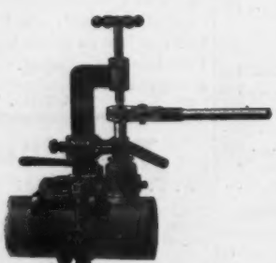

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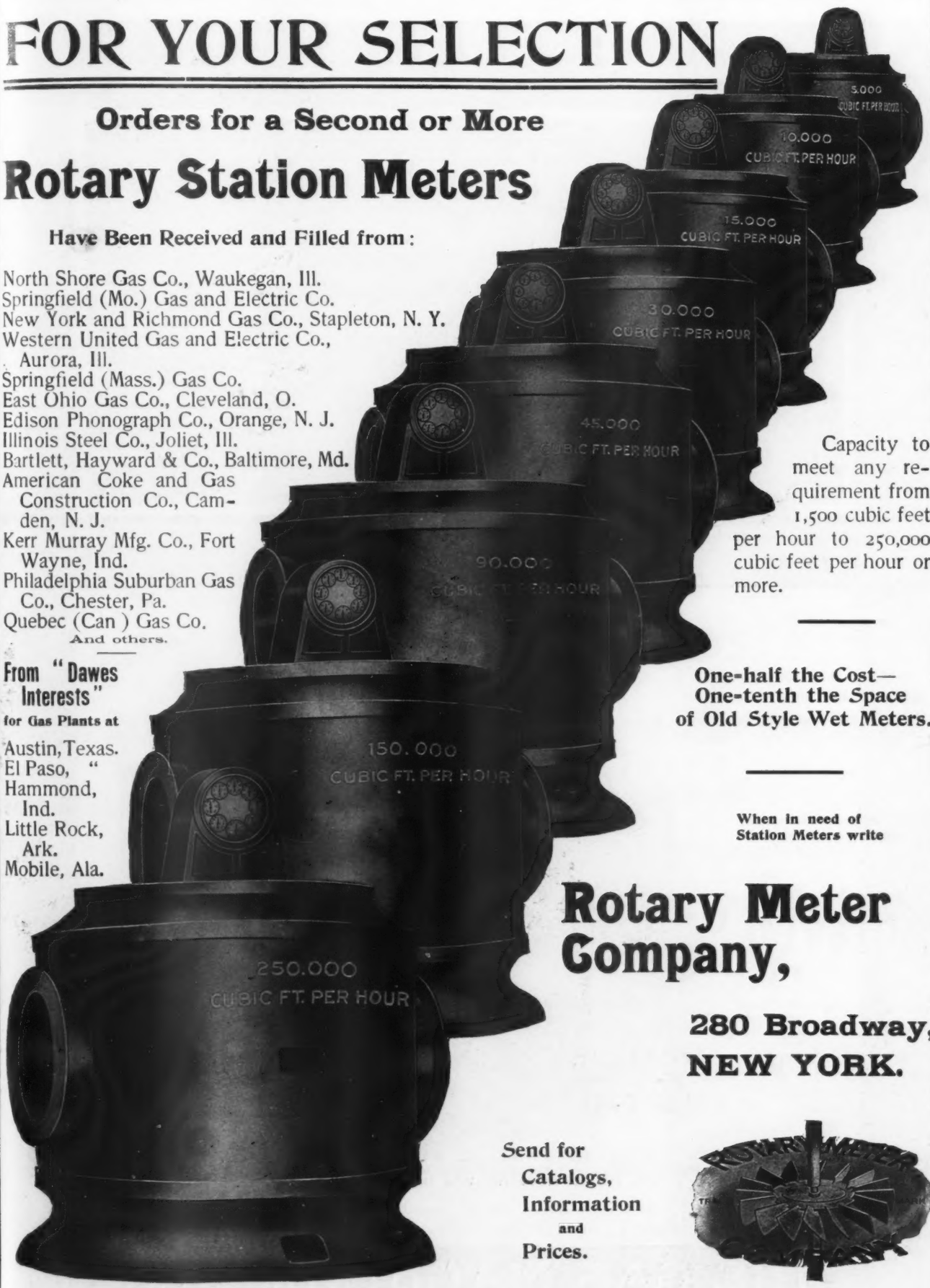

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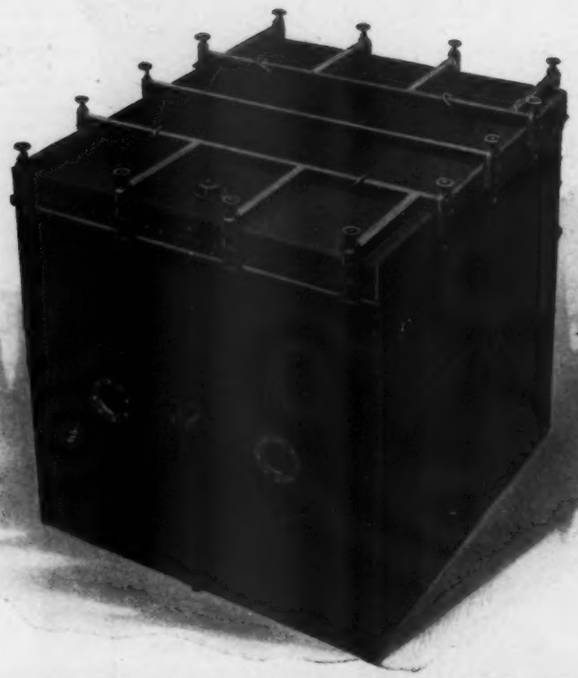

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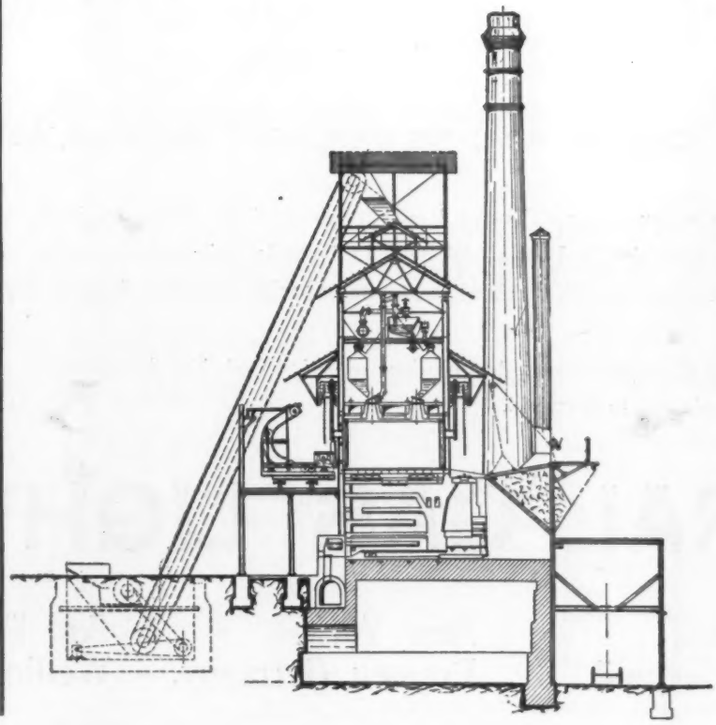

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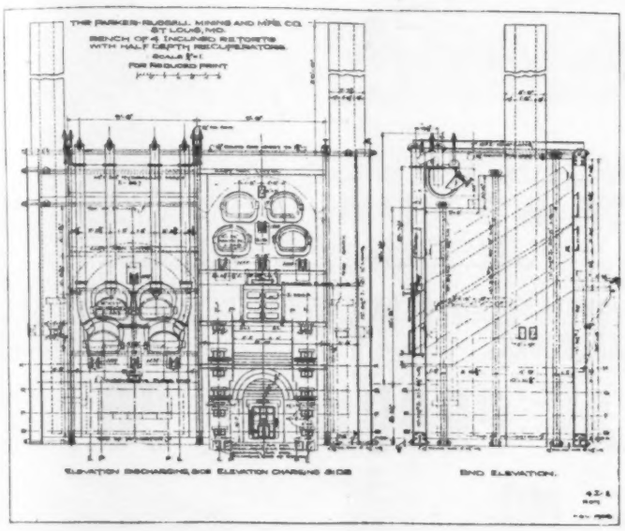

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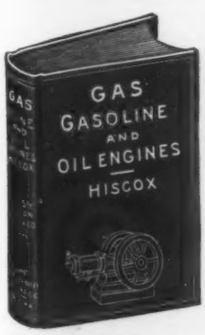

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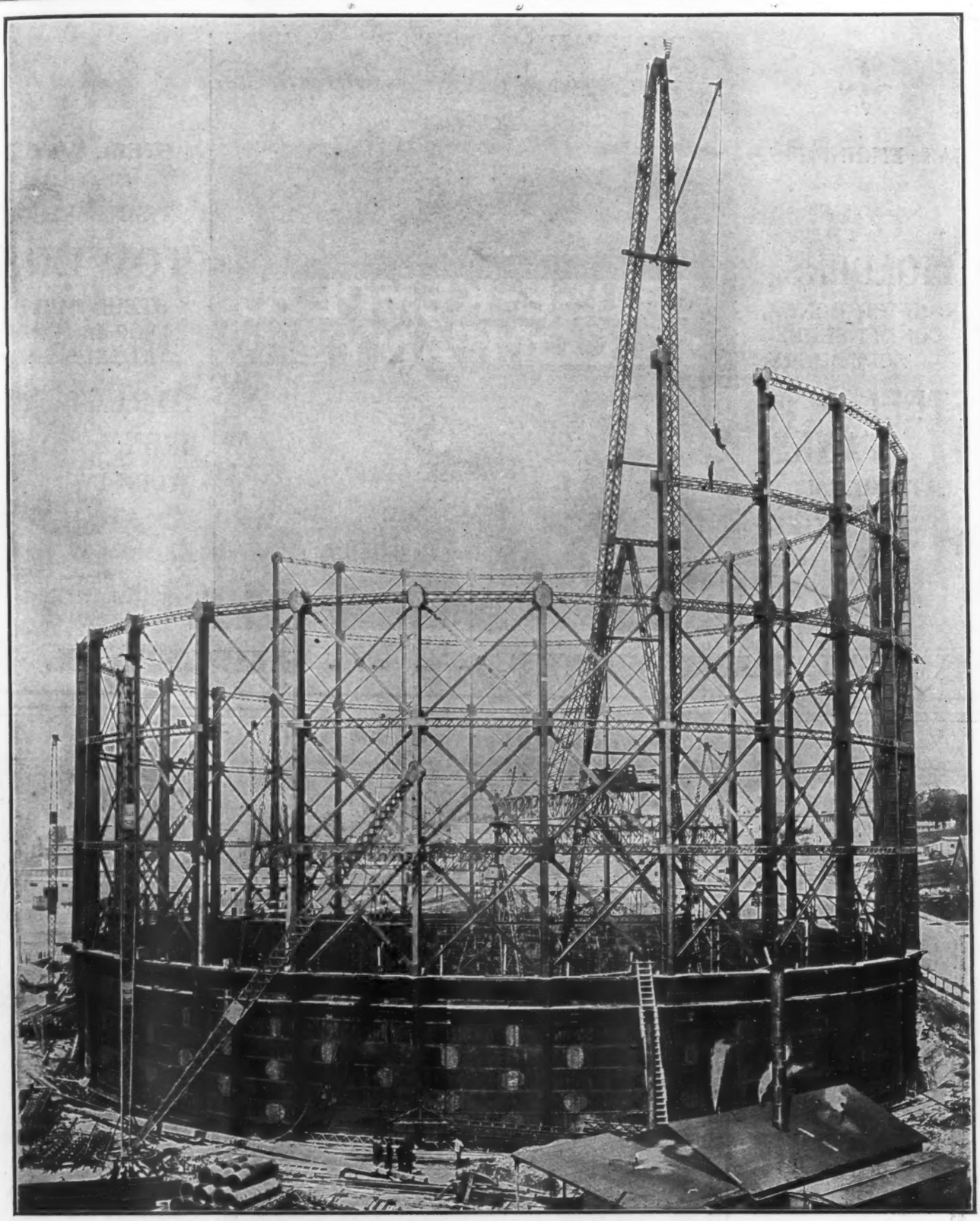

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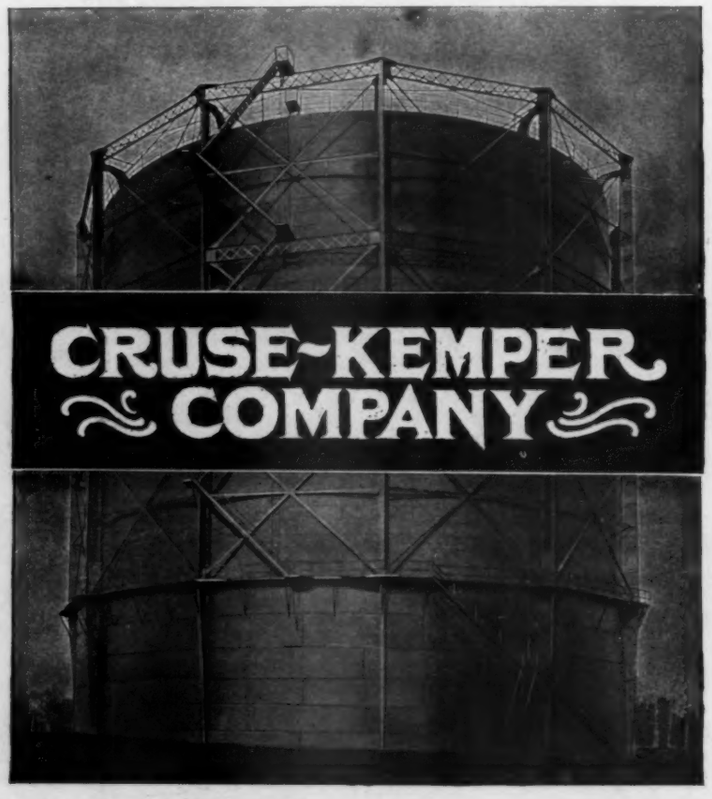

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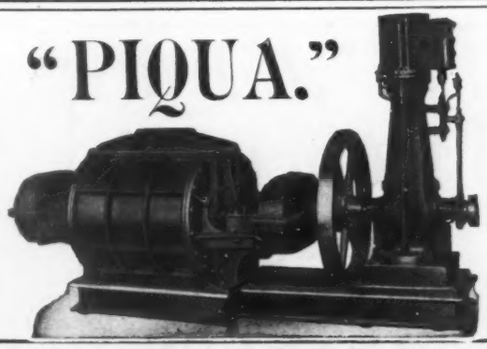

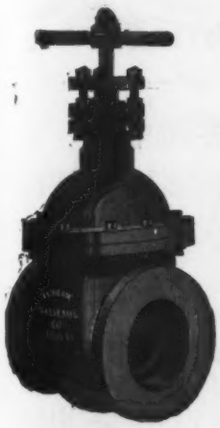

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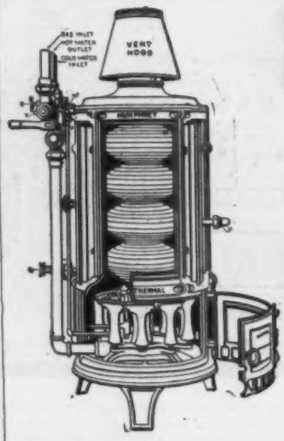

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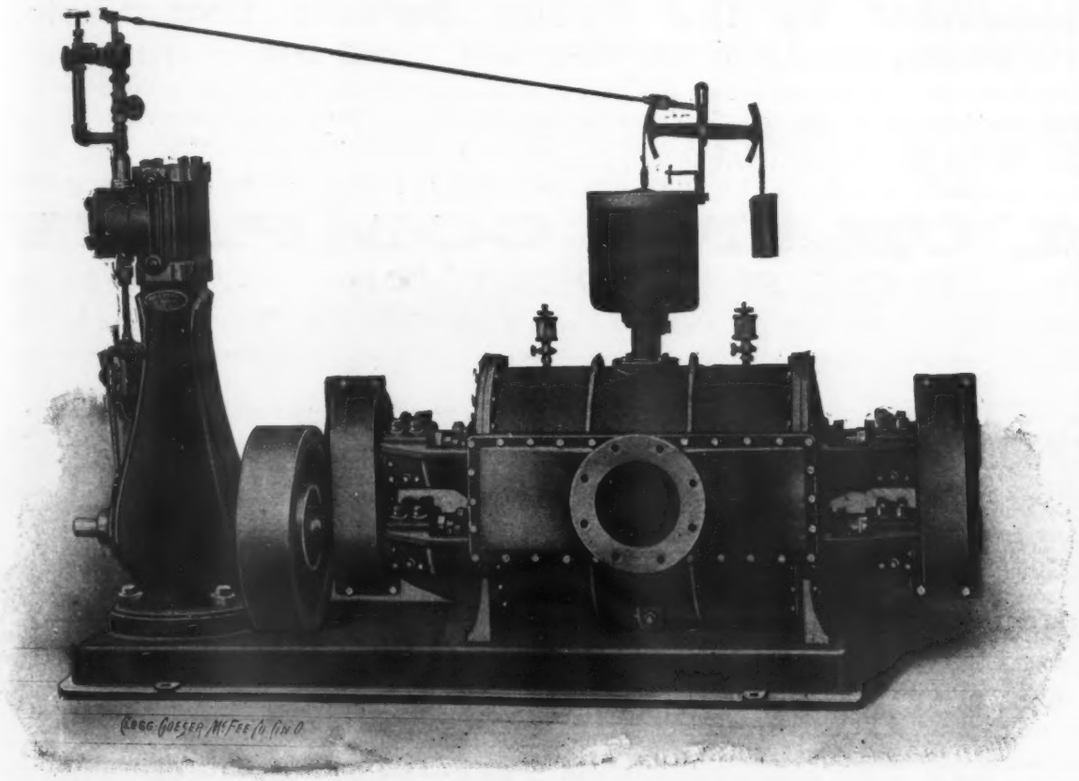

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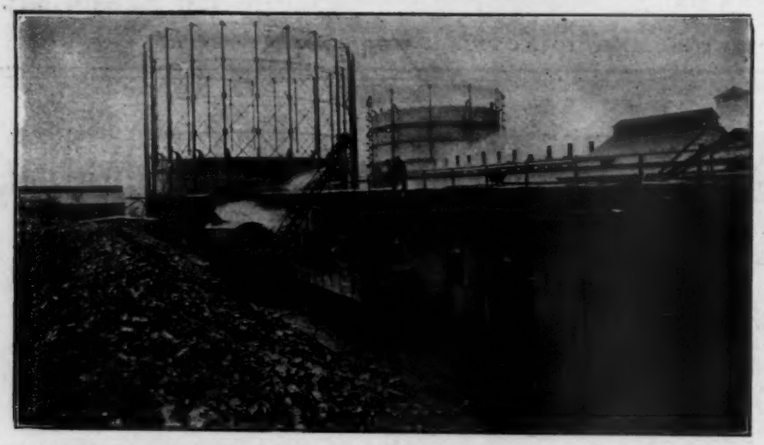

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PUBLIC LIGHTING TABLE.

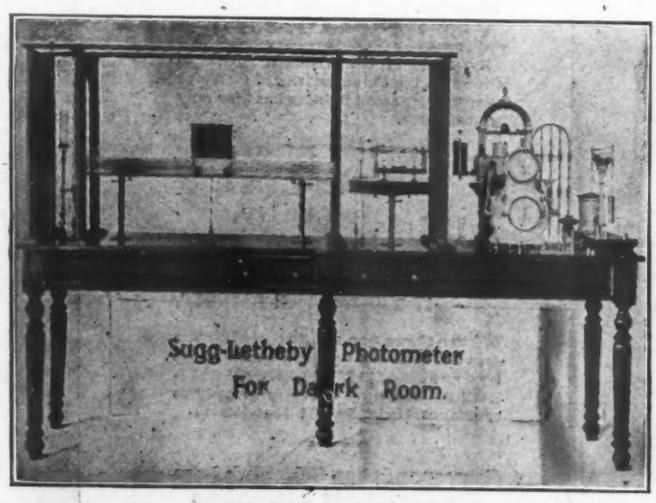
MAY, 1909.

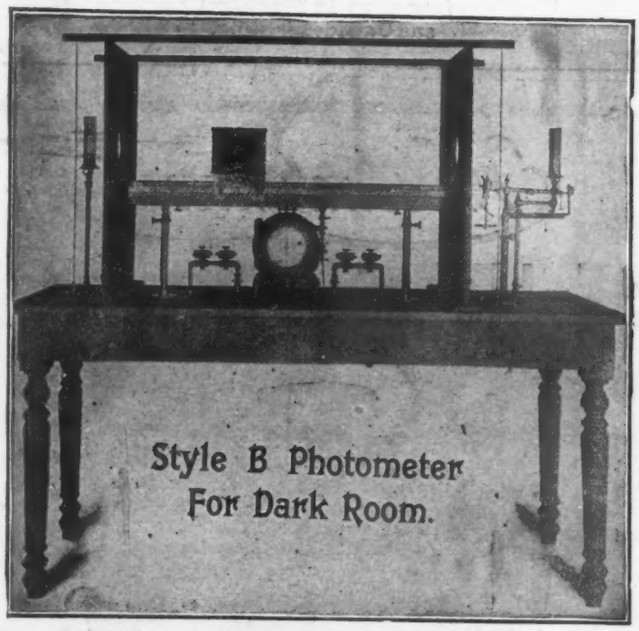
Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Sat.	1	3.00AM	4.00AM
Sun.	2	3.20	4.00
Mon.	3	3.40	4.00
Tue.	4	No L.	No L.
Wed.	5	No L FM	No L.
Thu.	6	No L.	No L.
Fri.	7	7.30PM	10.20PM
Sat.	8	7.30	11.30
Sun.	9	7.30	12.30AM
Mon.	10	7.30	1.20
Tue.	11	7.30	2.00
Wed.	12	7.30LQ	2.40
Thu.	13	7.30	3.10
Fri.	14	7.30	3.40
Sat.	15	7.30	3.40
Sun.	16	7.40	3.40
Mon.	17	7.40	3.40
Tue.	18	7.40	3.40
Wed.	19	7.40NM	3.40
Thu.	20	7.40	3.40
Fri.	21	7.40	3.40
Sat.	22	7.40	3.40
Sun.	23	7.40	3.40
Mon.	24	11.10	3.40
Tue.	25	11.50	3.40
Wed.	26	12.10 FQ	3.40
Thu.	27	12.40	3.40
Fri.	28	1.00	3.40
Sat.	29	1.20	3.40
Sun.	30	1.50	3.30
Mon.	31	2.10	3.30

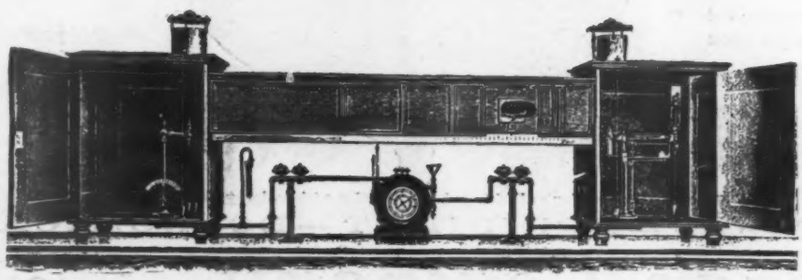
TOTAL HOURS DURING 1909.

By Table No. 1.

	Hrs.Min.
January	212.20
February	183.40
March	173.00
April	151.10
May	144.10
June	138.50
July	145.40
August	160.30
September	180.00
October	201.00
November	216.30
December	233.40
Total, yr.	2140.30







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PUBLIC LIGHTING TABLE.

MAY, 1909.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour From Time Given P. M.	Complete Extinguishing in 50 Minutes From Time Given A.M.
Sat.	1	6.47	3.52
Sun.	2	6.47	3.52
Mon.	3	6.47	3.52
Tue.	4	6.47	3.52
Wed.	5	6.47	3.52
Thu.	6	6.47	3.52
Fri.	7	6.57	3.42
Sat.	8	6.57	3.42
Sun.	9	6.57	3.42
Mon.	10	6.57	3.42
Tue.	11	6.57	3.37
Wed.	12	6.57	3.37
Thu.	13	6.57	3.37
Fri.	14	7.07	3.27
Sat.	15	7.07	3.27
Sun.	16	7.07	3.27
Mon.	17	7.07	3.27
Tue.	18	7.07	3.27
Wed.	19	7.07	3.27
Thu.	20	7.07	3.27
Fri.	21	7.12	3.22
Sat.	22	7.12	3.22
Sun.	23	7.12	3.22
Mon.	24	7.12	3.22
Tue.	25	7.12	3.22
Wed.	26	7.12	3.22
Thu.	27	7.12	3.22
Fri.	28	7.12	3.17
Sat.	29	7.12	3.17
Sun.	30	7.12	3.17
Mon.	31	7.12	3.17

TOTAL HOURS DURING 1909.

	Hrs.Min.
January	428.30
February	358.15
March	353.10
April	298.10
May	263.20
June	234.45
July	248.30
August	278.00
September	311.25
October	370.05
November	397.40
December	438.35
	3980.25
Deduct on account of 50 min. extinguishing time	30.25
Total, yr.	3950.00

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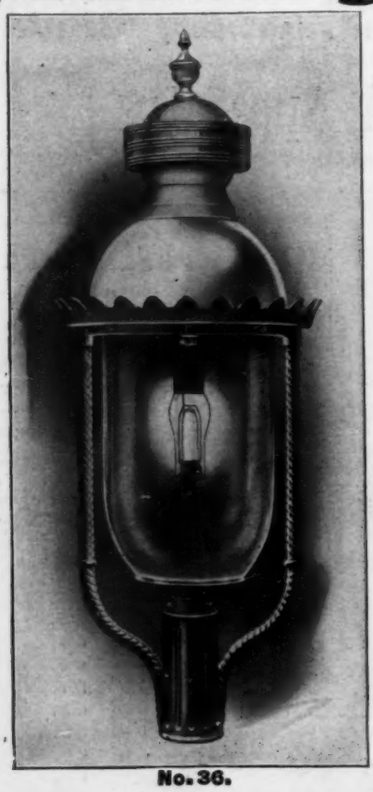

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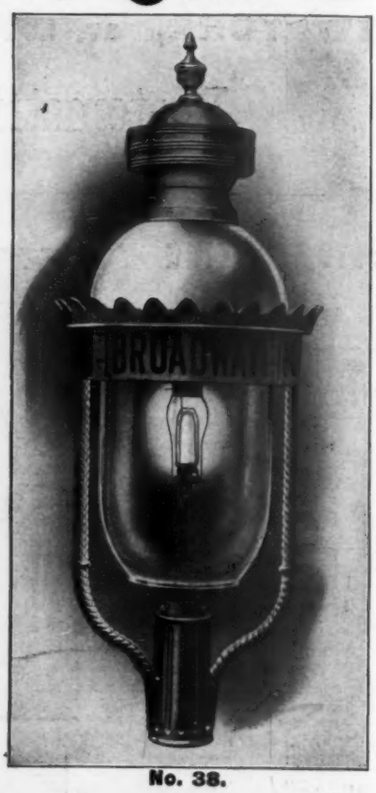

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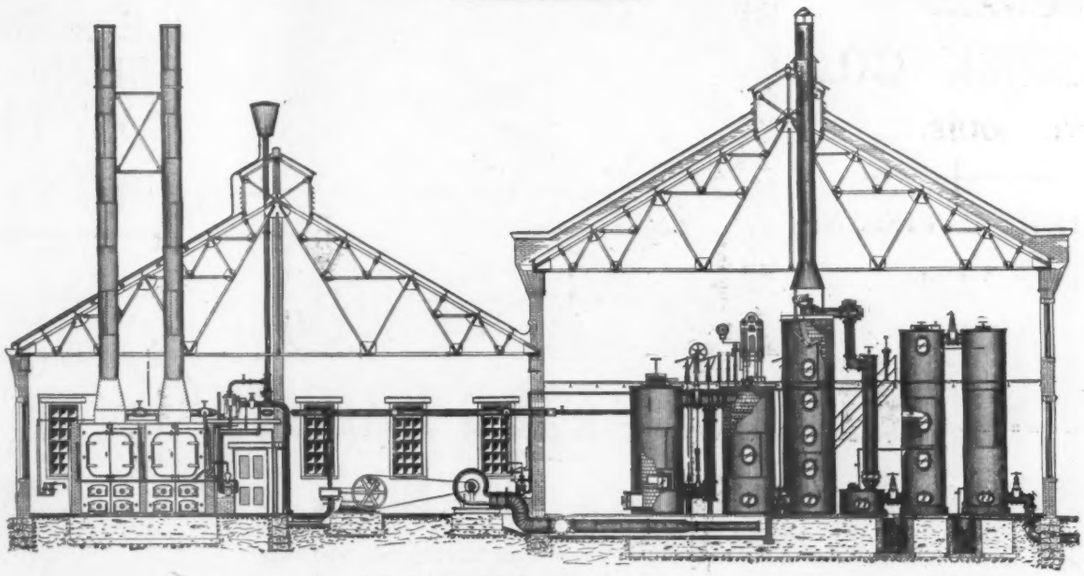

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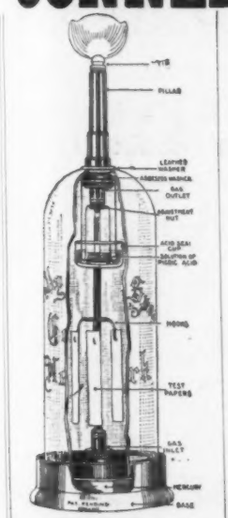

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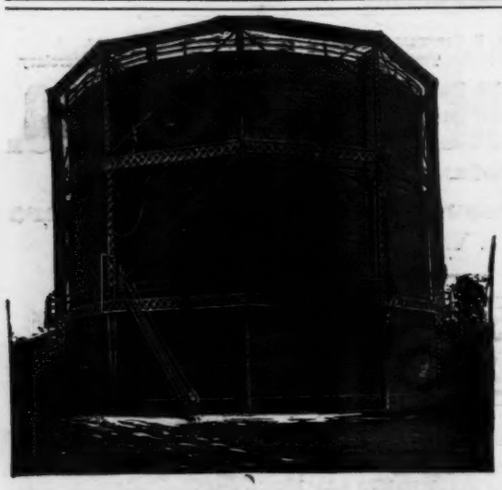

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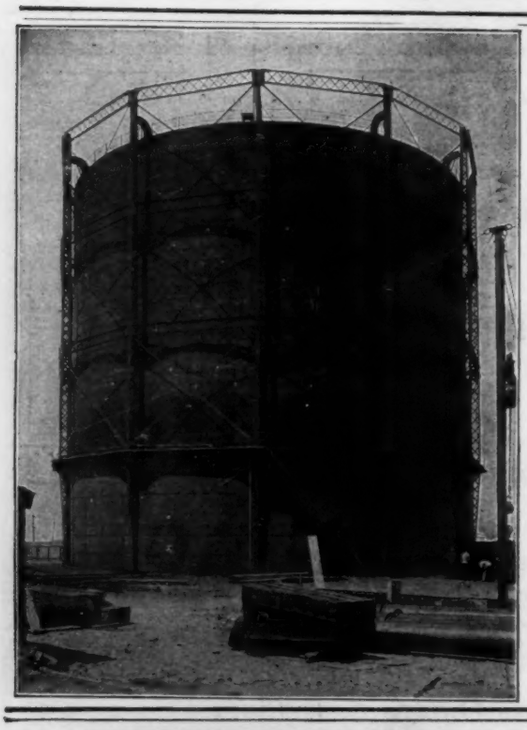

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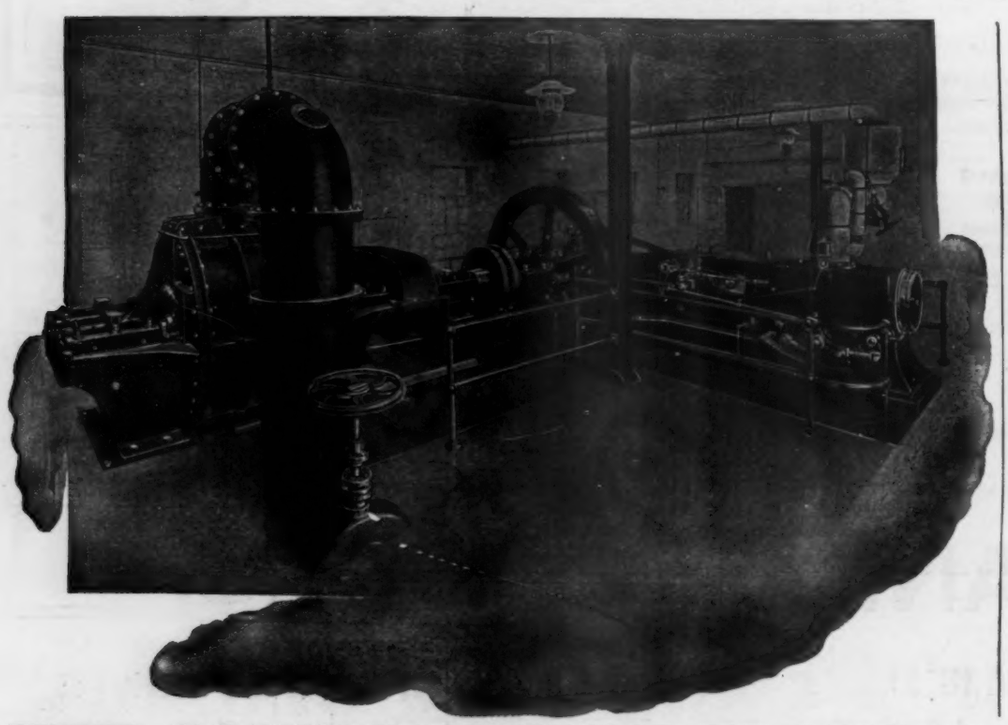

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